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A MANUAL

OF

MATERIA MEDICA

ESPECIALLY DESIGNED FOR STUDENTS OF PHARMACY

BY

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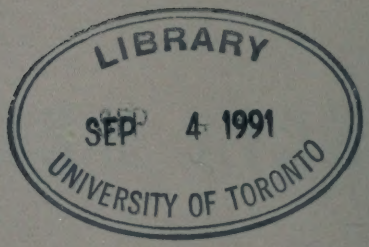

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PREFACE.

In the multiplicity of books treating of the various phases of Materia Medica, there seems to be a place for one especially condensed and written for the student of pharmacy. The author has attempted to present, in as few words as possible, the work usually given to such students.

A systematic arrangement of facts makes them easier to memorize. The author has adopted the general arrangement of Maisch's *Materia Medica* for the pharmacognosy, *i. e.*, giving the Latin name, synonyms, botanical name, etc.; and a modified arrangement of Hare's *Practical Therapeutics*, for the therapeutics, *i. e.*, giving the action and uses externally, on the alimentary canal, nervous system, circulation, respiration, etc. The order of taking up the vegetable drugs is nearly that of Culbreth's *Materia Medica*. Acknowledgment is made of the free use of these books.

In studying the pharmacognosy it is supposed that samples of drugs are at hand. The microscopic examination is not discussed, as there are several books which cover the ground very satisfactorily. In order to avoid repetition in the therapeutics, reference is made to other drugs, giving only the differences. The maximum and minimum doses are given in preference to the average dose because what the pharmacist wants to know is the dose beyond which one must go with caution.

E. A. R.

Nashville, Tenn., 1907

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MANUAL OF MATERIA MEDICA.

DEFINITIONS.

Materia Medica deals with the study of substances used in the treatment of diseases; this includes the origin or source, description, chemical and physical properties, tests, methods of preparation, doses, actions, therapeutics, and toxicology.

Pharmacology is a term used by some writers as synonymous with materia medica and by others as synonymous with pharmacodynamics.

Pharmacodynamics treats of the action of remedial agents on living organisms.

Therapeutics treats of the application of drugs and other agents in disease.

Empyrical therapeutics is a term applied to the knowledge of therapeutics obtained from clinical observations, as the use of potassium iodide in syphilis.

Rational therapeutics is a term applied to the knowledge obtained by studying the physiological action of drugs and the pathological condition of patients, and from these reasoning out what drug should be used for any disease, as digitalis for mitral regurgitation.

General therapeutics treats of curative agents other than medicines, as hygiene, food, mechanical agents, heat, electricity.

Pharmacognosy is a branch of materia medica and treats of the origin, description, identification, physical and chemical properties of drugs.

Toxicology treats of the symptoms, antidotes, treatment, detection, and doses of poisons.

METHODS OF ADMINISTERING MEDICINE.

1. *Epidermic.*—The application to the skin of medicines in the form of dusting powder, liniment, ointment, etc. Medicines so applied often have only a local effect, are slowly absorbed, but are unaffected by digestive processes as when taken by the mouth.

2. *Endermic.*—The removal of the cuticle by means of vesicants and the application of the agent to the denuded surface. This often produces a bad sore, is painful, and is now rarely resorted to.

3. *By the Mouth.*—This is the most common and convenient method; all kinds of medicines can be given in this way; they are more quickly absorbed than when given externally, but they may be changed by the digestive processes and do not act as quickly as when given by hypodermic injection.

4. *By Injection into the Rectum.*—In which case medicines are not affected by digestion, are not as readily absorbed as when given by the mouth, except perhaps in case of strychnine, should be small in volume, and in case of food should be predigested.

5. *By Injection into the Urethra or Vagina.*—Usually for local effect.

6. *By Inhalation.*—As in the form of a spray or insufflation.

7. *By Injection* into a serous cavity, usually for local effect.

8. *By Hypodermic Injection.*—The medicine must be in the form of a clear, neutral, non-irritating solution; usually 5 or 10 minims are injected. The advantages of this method are that the effect is quickly produced and the dose is small; the digestive processes do not interfere; the disadvantages are that it is painful, abscesses may form, and comparatively few remedies aside from the alkaloids can be thus given.

9. *By Parenchymatous Injection.*—Deep injection into the muscles, which is very painful.

10. *By Injection into Veins or Arteries.*—This method is rarely used except in case of transfusion of blood or physio-

logical salt solution where there has been a large loss of blood. There is danger of causing thrombosis or phlebitis, or of admitting air, which may prove instantly fatal.

CONDITIONS AFFECTING THE ACTION AND DOSES OF MEDICINES.

1. *Size of Dose.*—Not infrequently the same agent will have one effect when given in a small dose and quite the opposite in a large dose.

2. *Condition of the Drug.*—If it is soluble it will act to a greater extent and more quickly than when it is sparingly soluble.

3. *Rapidity of Absorption and Excretion.*—If quickly absorbed and slowly eliminated it will accumulate.

4. *Cumulative Action.*—Some drugs may be taken for a time without ill effect and then symptoms of poisoning rather suddenly develop. This may be due to the gradual accumulation of the drug or to the stoppage of the elimination or to a change in the rapidity of absorption. Digitalis is generally given as an example of this.

5. *Age.*—Children and the aged should usually receive smaller doses than those given to people in middle life. Different rules are given for the calculation of doses for children. (*a*) $\frac{\text{Age}}{\text{Age} + 12}$ of the adult dose. (*b*) $\frac{\text{Age} + 1}{\text{Age} + 20 \text{ or } 25}$ of the adult dose. (*c*) $\frac{\text{Weight}}{150}$ of the adult dose. Rule (*a*) is generally used and (*c*) rarely. In case of some drugs, as opium, children cannot bear the calculated dose, while in other cases a larger dose can be given than the calculated one. The dose for persons over seventy years of age should be three-quarters to one-half the adult dose.

6. *Sex.*—Women generally should receive smaller doses than men.

7. *Disease.*—The effect of a remedy may be quite different when given in disease from what it has in health; antipyretics

lower the temperature in fever, but not generally in health. Much larger doses of opium are given where pain is very great.

8. *Time of Administration.*—Agents given to aid the performance of some normal function should be given so as to produce their effect at the usual time of the normal action; hypnotics should be given in the early evening, purgatives so as to produce their effect in the morning.

9. *Idiosyncrasy.*—Some persons react quite differently to certain drugs from what the large majority of persons do; much smaller or much larger doses may be required, or quite opposite effects may be produced by the same-sized dose of the same drug.

10. *Habit or Toleration.*—After taking a drug for some time the body becomes somewhat accustomed to it and large doses are necessary to produce the desired effect.

11. *Condition of the Patient's Mind.*—If the patient fully believes that certain results will be produced, they generally follow even from minute doses.

12. *Synergists and Antagonists.*—The giving together of agents having similar actions often produce greater effect than expected, and agents having opposite actions may not have as much effect as expected.

VEGETABLE DRUGS.

(The drugs marked * are not official.)

CHONDRUS.

Synonyms.—Irish moss, Carrageen, Pearl moss.

Botanical Name.—Chon′-drus cris′-pus. *Natural Order:* Gigartinaceæ. *Habitat:* Atlantic Ocean, along the coast of Ireland and New England.

Part Used.—The dried plant. *Adulterants:* Allied plants.

Description.—Light yellow or yellowish-white, matted masses; the plant consisting of a slender, somewhat flattened base about one-half the length of the entire frond, which after repeated forking terminates in a number of palmately branching, somewhat enlarged, emarginate or two-lobed segments; translucent, sometimes with fruit bodies embedded near the apex of the segments, elastic, cartilaginous; sea-weed odor; mucilaginous, somewhat saline taste. Grows on submerged rocks; collected in spring (best) and summer by means of hooks, or on the beach; bleached on the sand by sprinkling with sea-water and turning each day for about two weeks.

Active Principles.—A mucilage called Carrageenin, Mineral salts.

Action and Uses.—**Demulcent** bronchial affections and in irritation of the alimentary and genito-urinary tracts. Food value is probably small.

Dose.—4ʒ (15 Gm.) in the form of a decoction.

FUCUS.*

Synonyms.—Bladder-wrack, Sea-wrack.

Botanical Name.—Fu′-cus ve-sic-u-lo′-sus. *Natural Order:* Fucaceæ. *Habitat:* Atlantic and Pacific Oceans.

Part Used.—The dried plant. *Adulterant:* Fucus nodosus.

Description.—Long, flattened, branched thallus; wrinkled, black, sometimes whitish incrustation; air bladders in pairs; sea-weed odor; mucilaginous, saline taste. F. nodosus has single air bladders.

Active Principles.—Mucilage, Bromides, Iodides, Phosphates.

Action and Uses.—Alterative to reduce obesity.

Dose.—$\frac{1}{2}$ to 2ʒ (2 to 8 Gm.) in form of decoction.

AGAR-AGAR.*

Synonyms.—Chinese, Japanese, or Vegetable gelatin.

Botanical Name.—Eu-cheu'-ma ge-lat'-i-num, and other species. *Habitat:* Indian Ocean.

Part Used.—Hot-water extract.

Description.—Usually in bundles of shreds about two feet long, sometimes in thin sheets or cakes; white or yellowish white; mucilaginous taste.

Active Principle.—Gelose.

Uses.—Principally in making culture media for bacteria.

ERGOTA.

Synonyms.—Ergot, Spurred ergot, Rye smut, Secale cornutum.

Botanical Name.—Clav'-i-ceps pur-pu'-re-a. *Natural Order:* Hypocreaceæ. *Habitat:* Europe.

Part Used.—Sclerotium, replacing the grain of rye (Secale cereale). *Adulterants:* Old, inert ergot.

Description.—Subcylindrical, obscurely three-angled, tapering toward both ends, but obtuse, somewhat curved, $\frac{3}{5}$ to $1\frac{1}{5}$ in. (1.5 to 3 Cm.) long, and about $\frac{1}{8}$ in. (3 Mm.) thick; externally purplish black; longitudinally furrowed on each side, more conspicuously on the concave side; fracture short, pinkish or reddish white inside; odor peculiar and heavy; taste disagreeable.

Ergot should not be kept longer than a year and not at all in the powdered form. It should not be dried too much, as it is thus injured, and should not be left too damp on account of molding. Chloroform (preferably) or formaldehyde vapor tends to prevent rancidity of the oil and to destroy insects. Spanish ergot is the better-looking, but Russian is thought to be more active.

Active Principles.—Not definitely known, probably Cornutine, Ergotine, and Sphacelotoxin.

Action and Uses.—Alimentary Canal: Ergot impairs digestion, constricts the bloodvessels, and stimulates peristalsis. *Heart:* Slowed by depressing heart muscle. Blood pressure is first lowered, but soon rises on account of contraction of arterioles (veins less) generally. The two main uses are to stop hemorrhage and contract vessels. It is a **hemostatic** for capillary hemorrhage, but should not be given for hemorrhage from large arteries on account of great rise of blood pressure; used in postpartum hemorrhage and hemoptysis. *Uterus:* Ergot is a powerful **ecbolic,** causing tonic contraction of the pregnant uterus; it should not be given before the head of the child is born on account of danger to the child and mother, and frequently not till after the placenta is expelled. Its chief use is to prevent postpartum hemorrhage and to contract the uterus. It is an **emmenagogue,** used in dysmenorrhea, menorrhagia, and metritis. *Secretions:* These are diminished, due to contraction of vessels; **anhydrotic** in cases of night-sweating of phthisis; **antisialic, antigalactagogue.**

Toxicology.—Symptoms of acute poisoning are: vomiting, purging, slow heart, vertigo, fall of temperature, and convulsions. Chronic poisoning has resulted from eating rye bread containing ergot. Symptoms of two forms: (1) Gangrene due to shutting off of blood in extremities, formication followed by anesthesia. (2) Convulsions and asphyxia.

Preparations and Doses.—Extract, 2 to 10 gr. (0.13 to 0.65 Gm.). Fluidextract, $\frac{1}{4}$ to 2ʒ (1 to 8 Cc.). Wine, 1 to 4ʒ (4 to 15 Cc.).

USTILAGO.*

Synonyms.—Corn smut, Corn ergot.

Botanical Name.—Us-ti-la′-go may′-dis (fungus on Zea mays). *Natural Order:* Ustilaginaceæ. *Habitat:* Temperate zone, wherever corn is grown.

Part Used.—Spores with enveloping membrane.

Description.—Irregular masses, consisting of a transparent membrane enveloping blackish, globular, or oval spores; odor heavy; taste disagreeable. It should be kept in a dry place and not longer than a year.

Active Principles.—Not definitely known, probably Secaline and Sclerotic acid.

Action and Uses.—**Emmenagogue** and **ecbolic,** acting somewhat like ergot; not used much.

Dose.—½ to 1ʒ (2 to 4 Gm.).

AGARICUS.*

Synonyms.—White, Purging, or Larch agaric; Boletus.

Botanical Name.—Po-lyp′-o-rus of-fi-ci-na′-lis. *Natural Order:* Polyporei. *Habitat:* Europe, Asia.

Part Used.—Fungus deprived of outer rind.

Description.—Irregular, light, spongy masses; resinous, friable, white; nearly odorless; sweetish, then acrid, bitter taste.

Active Principle.—Agaricin.

Action and Uses.—Externally as **counterirritant;** internally as **anhydrotic** for night-sweating of phthisis; as a drastic **purgative.**

Dose.—5 to 30 gr. (0.3 to 2 Gm.). Agaricin, $\frac{1}{10}$ to 1 gr. (0.006 to 0.06 Gm.), slowly increased.

CETRARIA.*

Synonym.—Iceland moss.

Botanical Name.—Ce-tra'-ri-a is-lan'-di-ca. *Class:* Lichenes. *Habitat:* Northern hemisphere.

Part Used.—Dried lichen. *Adulterants:* Other lichens.

Description.—Thallus 2 to 4 in. (5 to 10 Cm.) long; irregularly branched, fringed, and channeled lobes; thin, brittle, cartilaginous when wet; green to brown above; gray below, small, depressed spots underneath; mucilaginous, bitter taste.

Active Principles.—Lichen starch (lichenin), Isolichenin, Cetrarin.

Action and Uses.—Powder has been used for epistaxis; **demulcent** for sore throat, diarrhea; nutritive, tonic, laxative.

Dose.—½ to 1℥ (2 to 4 Gm.) in form of decoction.

LACMUS.*

Synonym.—Litmus.

Botanical Name.—Comes from various lichens. *Natural Order:* Lichenes. *Habitat:* Atlantic Islands, Europe.

Part Used.—Lichen.

Description.—Occurs in blue, rectangular cakes or cubes; made by fermenting the powdered lichen with potassium carbonate and stale urine, mixing with chalk, and molding. Cudbear and orchil are produced somewhat similarly.

Active Principles.—Azolitmin and other coloring substances.

Uses.—As **indicator** for acids and alkalies.

ASPIDIUM.

Synonyms.—Male fern, Male shield fern, Sweet brake, Bear's paw root.

Botanical Names.—(1) Dry-op'-te-ris fi'-lix-mas. (2) D. mar-gin-a'-lis. *Natural Order:* Filices. *Habitat:* (1) North temperate zone. (2) North America.

Part Used.—Rhizome. *Adulterants:* Other ferns; old, inert rhizomes; very often adulterated.

Description.—Before being peeled, 4 to 6 in. (10 to 15 Cm.) long by 2 to 3 in. (5 to 7 Cm.) thick, including the densely imbricated, dark-brown, cylindraceous, slightly curved stipe bases and the dense mass of brownish, glossy, transparent, soft, chaffy scales; when peeled, $\frac{2}{5}$ to $\frac{4}{5}$ or $1\frac{1}{5}$ in. (1 to 2 or 3 Cm.) thick, cylindraceous and nearly straight, or curved and tapering toward one end, roughly scarred with remains of the stipe bases, or bearing several coarse, longitudinal ridges and grooves; pale green when first peeled, becoming pale brown; fracture sharp, pale green, the texture rather spongy, exhibiting from 6 to 10 fibrovascular bundles in an interrupted circle; odor disagreeable; taste bitter-sweet, astringent, acid, and nauseous.

The chaff, together with the dead portions of the rhizome and stipes, should be removed, and only such portions used as have retained their internal green color. Powdered aspidium should be freshly prepared and have a bright-green color. Preparations keep better than the crude drug and the unpeeled rhizomes keep better than the peeled, although the latter have nearly displaced the former. It should not be kept longer than a year and is best collected in the late summer.

Active Principle.—Filicic acid.

Action and Uses.—**Teniacide** for tapeworms; best given on an empty stomach in the morning, followed some hours later by a brisk purgative to remove the dead worm. Castor oil if used as the purgative may aid the absorption of filicic acid, resulting in poisoning. An overdose may cause vomiting, purging, colic, temporary or permanent blindness, convulsions, collapse, and death.

Preparation and Dose.—Oleoresin 15 to 60 ♏ (1 to 4 Cc.) in capsules or emulsion.

LYCOPODIUM.

Synonyms.—Vegetable sulphur or powder, Club moss, Wolf claw.

Botanical Name.—Ly-co-po′-di-um cla-va′-tum and other species. *Natural Order:* Lycopodiaceæ. *Habitat:* Europe (chiefly), Asia, North America.

Part Used.—Spores. *Adulterants:* Pollen of pine trees (detected by microscope), starch (by iodine), sand or talc (by throwing on water).

Description.—A fine, pale-yellowish, very mobile powder, nearly odorless and tasteless, not wetted by water unless triturated, burning with a quick flash and hissing noise when thrown into a flame. Spores are tetrahedral with one convex side, the surface being delicately reticulated.

Active Principle.—Fixed oil (about 50 per cent.).

Action and Uses.—**Protective** as a dusting powder on abraded surfaces, also in pharmacy to prevent the sticking of pills and suppositories.

TEREBINTHINA.

Synonyms.—Crude turpentine, Gum thus, Thus Americanum, Common frankincense. Of the tree, Long-leaved, Georgia, Pitch, or Broom pine.

Botanical Name.—Pi′-nus pa-lus′-tris, and other species. *Natural Order:* Pinaceæ. *Habitat:* Southern United States.

Part Used.—Concrete oleoresin.

Description.—Yellowish, opaque, more or less tough masses; brittle in the cold, getting harder with age, lighter internally, sticky, more or less glossy, turpentine-like odor and taste. Not often seen in commerce in a liquid state. Obtained by making a cavity (box), of a quart to a gallon capacity, in the tree; above the box a V-shaped portion of the bark is removed. The exudation begins in March and flows till October; the first year's exudation (virgin dip) is the best, but the tree is worked for three or four years.

Active Principles.—Volatile oil, Resin.

Action and Uses.—The value depends on the oil chiefly. *External:* Dilates vessels, producing a feeling of warmth, then anesthesia. Rubefacient, irritant, **counterirritant,** for chronic inflammations, rheumatism, bronchitis, pleurisy, neuralgia, lumbago, cramps; **antiseptic** and **disinfectant** for small wounds and old, suppurating sores; **parasiticide** for ringworm. *Alimentary canal:* Dilates vessels, increases saliva and gastric juice, increases peristalsis, expels gas, reflexly stimulates the heart. **Carminative** in flatulent dyspepsia; **antiseptic** and hemostatic in typhoid fever where there is tympanites or diarrhea; **anthelmintic** for tapeworms. *Circulation:* Small doses stimulate the heart and contract bloodvessels; large doses slow the heart. **Hemostatic** in cases of hemorrhage from lungs or alimentary canal. *Respiration:* Stimulates respiratory movements, irritates mucous membrane, excites coughing, increases and disinfects secretion; in some cases it allays coughing and diminishes secretion; **expectorant** for bronchitis. *Kidneys:* Causes greater irritation than most oils; small doses increase the amount of urine; large doses may cause high-colored urine, albuminuria, hematuria, micturition, strangury; urine has odor of violets. Sometimes used in incontinence of urine and chronic cystitis; should not be used where kidneys are already inflamed. Slight **antipyretic.** *Elimination:* Through kidneys, air passages, bile, and skin, sometimes causing eruption. *Antidote:* Old oil containing ozone is used for phosphorus poisoning. Toxic doses of the oil slow the heart, cause muscular relaxation, dilation of pupils, labored breathing, cyanosis, and asphyxia.

Preparations and Doses.—Rectified oil of turpentine 5 to 20 ♏ (0.3 to 1.3 Cc.); as anthelmintic ½ to 2℥ (2 to 8 Cc.). Emulsion ½ to 2℥ (2 to 8 Cc.). Liniment. Compound resin cerate.

RESINA.

Synonyms.—Rosin, Resin, Colophony.

Part Used.—Residue left after distilling off the oil from turpentine.

Description.—Usually in sharp, angular fragments; translucent; amber-colored, but varies to almost black, due to amount of heat used; usually covered with a yellow dust; brittle at ordinary temperature; may be powdered, but soon cakes; fracture shiny and conchoidal, softens at 100° C.; burns with a dense smoke; heavier than water; faint turpentine-like odor and taste.

Active Principle.—Abietic anhydride.

Action and Uses.—**Antiseptic** and **stimulant** to indolent ulcers and wounds; used to harden ointments and render plasters adhesive.

Preparations.—Rosin cerate, Cantharides cerate.

PIX LIQUIDA.

Synonyms.—Tar, Pine tar.

Part Used.—Product of destructive distillation of pine wood.

Description.—Semiliquid, viscid, blackish brown, translucent in thin layers, becoming granular and opaque with age; empyreumatic, turpentine-like odor; sharp, bitter taste; heavier than water. Dead and waste wood is put into a pile, covered with earth, set afire at the top and allowed to burn slowly and imperfectly, the tar running out at the bottom; sometimes ovens constructed for the purpose are used.

Active Principles.—Complex liquid, containing oil, creosote, phenol, acetic acid, methyl alcohol, etc.

Action and Uses.—Similar to oil of turpentine. **Irritant, stimulant,** and **disinfectant** for dry, scaly skin diseases—psoriasis, chronic eczema, prurigo, scabies, pruritus—and unhealthy sores. **Expectorant,** for bronchitis and winter cold.

Preparations and Doses.—Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.). Syrup, 1 to 4 ʒ (4 to 15 Cc.). Wine (N. F.), 2 to 8 ʒ (8 to 30 Cc.). Ointment.

PIX CANADENSIS.*

Synonyms.—Canada or Hemlock pitch. Of tree, Hemlock or Spruce pine.

Botanical Name.—Tsu'-ga can-a-den'-sis. *Natural Order:* Pinaceæ. *Habitat:* North America.

Part Used.—Resinous exudation.

Description.—Red-brown masses, opaque, brittle, but assumes shape of the container; glassy, conchoidal fracture; turpentine-like odor and taste.

Active Principles.—Resin, Volatile oil.

Action and Uses.—Similar to Burgundy pitch.

SUCCINUM.*

Synonym.—Amber.

Botanical Name.—Pi-ni'-tes suc-cin'-i-fer, and other species. *Natural Order:* Pinaceæ. *Habitat:* Shores of Baltic Sea, Asia, North America.

Part Used.—Fossilized resin.

Description.—Whitish to red brown, transparent masses; hard, brittle, glassy, conchoidal fracture; odorless; tasteless. The largest lump found weighed about 13 pounds; often encloses remains of insects now extinct.

Uses.—For preparing oil of amber and succinic acid, making mouth-pieces for pipes. The oil, obtained by destructive distillation, is used externally as a **counterirritant** and internally as an **antispasmodic** and stimulant to secretions. Succinic acid, also obtained by destructive distillation, is rarely used.

TEREBINTHINA CANADENSIS.

Synonyms.—Canada turpentine or balsam, Balsam of fir. Of tree, Balsam fir, Balsam spruce, Balm of Gilead fir.

Botanical Name.—A′-bi-es bal-sa-me′-a. *Natural Order:* Pinaceæ. *Habitat:* North America.

Part Used.—Oleoresin. *Adulterant:* Rosin dissolved in oil of turpentine.

Description.—Viscid, pale yellow or greenish yellow, transparent, gradually drying to a transparent varnish on exposure; turpentine-like odor; acrid taste. It accumulates in vesicles in the bark and is drawn into the collector's can. The dried leaves of the tree are used in making pine or balsam pillows.

Active Principles.—Resin, Oil.

Action and Uses.—Similar to ordinary turpentine. Used largely in making permanent microscopic mounts.

PIX BURGUNDICA.*

Synonym.—Burgundy pitch.

Botanical Name.—A′-bi-es a′-bi-es. *Natural Order:* Pinaceæ. *Habitat:* Europe.

Part Used.—Resinous exudation. *Adulterant:* Pine resin.

Description.—Hard and brittle, but gradually assuming the shape of the container; opaque or translucent; yellowish brown; turpentine-like odor; aromatic, sweetish taste.

Active Principles.—Resin, Volatile oil.

Action and Uses.—Irritant, **counterirritant, stimulant**; used for rheumatism, lumbago, bronchitis, pleurisy, pneumonia.

JUNIPERUS.*

Synonym.—Juniper berries.

Botanical Name.—Ju-nip′-er-us com-mu′-nis. *Natural Order:* Pinaceæ. *Habitat:* Europe (chiefly), North America, Asia, Africa.

Parts Used.—Fruit and Volatile oil.

Description.—The berries are nearly round, about $\frac{1}{3}$ in. (8 Mm.) in diameter; dark purplish with grayish bloom; pulp yellowish brown, containing oil cells and usually three bony seeds which have oil glands on the surface; characteristic odor and taste.

Active Principle.—Volatile oil.

Action and Uses.—The oil is mainly used and is similar to oil of turpentine, but not so liable to cause indigestion, albuminuria, or hematuria. Chiefly used as **diuretic** in dropsies, pyelitis, and cystitis. It is stomachic, diaphoretic, and carminative.

Preparations and Doses.—Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.). Spirit and Compound spirit, 1 to 4 ℥ (4 to 15 Cc.).

SABINA.

Synonym.—Savin.

Botanical Name.—Ju-nip′-er-us sa-bi′-na. *Natural Order:* Pinaceæ. *Habitat:* Europe (chiefly), North America, Asia.

Part Used.—Tops.

Description.—Short, thin, subquadrangular branchlets; leaves dark green, in four rows, opposite, scale-like, ovate-lanceolate, more or less acute, appressed, imbricated, having on the back a shallow groove containing an oblong or roundish gland; sometimes mixed with shriveled, blackish fruit; odor terebinthinate; taste disagreeable and bitter.

Active Principle.—Volatile oil.

Action and Uses.—Similar to oil of turpentine, but more irritating; externally, may cause vesication; internally, severe irritant to alimentary and genito-urinary tracts, particularly the ovaries and uterus, contracting the pregnant uterus. Used as **emmenagogue** in dysmenorrhea, amenorrhea; **ecbolic** to produce abortion, but doses sufficient to do this may cause poisoning and death.

Preparations and Doses.—Fluidextract, 5 to 15 ♏ (0.3 to 1 Cc.). Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.).

THUJA.*

Synonyms.—Arbor vitæ, White cedar.

Botanical Name.—Thu′-ja oc-ci-den-ta′-lis. *Natural Order:* Pinaceæ. *Habitat:* North America.

Part Used.—Fresh tops.

Description.—Flattened twigs, lateral leaf scales; leaves at end of the twig are broad, longer farther back; roundish, elevated gland on back of leaf; odor balsamic and terebinthinate; taste pungent, aromatic, camphoraceous.

Active Principle.—Volatile oil.

Action, Uses, and Dose.—Similar to savin.

DAMMARA.*

Synonym.—Dammar.

Botanical Name.—Ag′-a-this lo-ran-thi-fo′-li-a. *Natural Order:* Pinaceæ. *Habitat:* East Indies.

Part Used.—Resinous exudation.

Description.—Rounded tears, covered with powder; white to pale straw color; glassy fracture; odorless; tasteless.

Active Principle.—Resin.

Uses.—Chiefly in varnishes.

SANDARACA.*

Synonym.—Sandarac.

Botanical Name.—Cal-li′-tris quad-ri-val′-vis, and other species. *Natural Order:* Pinaceæ. *Habitat:* Africa.

Part Used.—Resinous exudation. *Adulterant:* Rosin.

Description.—Pale-yellow, elongated tears, $\frac{1}{5}$ to $\frac{3}{5}$ in. (0.5 to 1.5 Cm.) long, covered with dust; brittle, glassy fracture, clear in the centre; terebinthinate odor; bitter taste, pulverulent when chewed.

Active Principles.—Resins, Volatile oil.

Uses.—Chiefly in varnishes, also in stimulating ointments.

ZEA MAYS.

Synonyms.—Indian corn, Maize.

Botanical Name.—Ze′-a ma′-ys. *Natural Order:* Gramineæ. *Habitat:* Cultivated in temperate zones.

Parts Used.—Silk consisting of styles and stigmas, Starch.

Description.—Silk: Matted mass of thread-like filaments 2 to 6 in. (5 to 15 Cm.) long; yellowish or brownish; nearly odorless, sweetish taste. Starch: Fine powder or angular masses, consisting usually of polygonal grains, with a central fissure; odorless; tasteless. Dextrin is usually obtained by heating starch with dilute acid; it is soluble in water.

Active Principle.—Of silk, maizenic acid.

Action and Uses.—Of silk: Mild but fairly certain **diuretic**, used in renal and cardiac dropsy; mild **anodyne** in cystitis, strangury, tenesmus. Of starch: Externally, dusting powder for chafing, itching, urticaria, and to absorb secretions; as a poultice in chronic skin diseases. Internally, **demulcent** and nutritive. Diluted starch paste is a good vehicle for administering drugs by the rectum. Dextrin is used as an emulsifying agent.

Preparations and Doses.—Of silk: Fluidextract* ½ to 2 ℥ (2 to 8 Cc.). Infusion* (1 to 8), 4 to 8 ℥ (120 to 240 Cc.).

SACCHARUM.

Synonyms.—Sugar, Cane sugar.

Botanical Name.—(1) Sac′-cha-rum of-fi-ci-na′-rum (sugar cane), and other species or varieties of Sorghum. *Natural Order:* Gramineæ. *Habitat:* Tropics and subtropics. (2) Be′-ta vul-ga′-ris (sugar beet). *Natural Order:* Chenopodiaceæ. *Habitat:* Europe, North America.

Part Used.—Sugar.

Description.—White, hard, distinct granules; permanent; soluble in 0.46 parts of water and 137.2 of alcohol; odorless; sweet taste.

Action and Uses.—In small amounts it is slightly **demulcent.** In large amounts it is **laxative.** Used to disguise disagreeable medicines, as a preservative and food. Glucose has some diuretic effect.

TRITICUM.

Synonyms.—Couch grass, Quick grass, Quickens, Dog grass.

Botanical Name.—Ag-ro-py'-ron re'-pens. *Natural Order:* Gramineæ. *Habitat:* Europe (chiefly), North America.

Part Used.—Rhizome.

Description.—Subcylindrical, long, but usually cut into segments $\frac{1}{5}$ to $\frac{1}{3}$ in. (5 to 8 Mm.) long, $\frac{1}{25}$ to $\frac{1}{12}$ in. (1 to 2 Mm.) in diameter; longitudinally furrowed, tough, pale yellow to brown yellow, nearly smooth, hollow, slight odor, sweet taste.

Active Principles.—Triticin, Sugar.

Action and Uses.—Chiefly as a **demulcent** and **diuretic** in dysuria, cystitis, and affections of the genito-urinary tract. **Emollient,** nutritive; infusion has been used as **refrigerant** in fevers.

Preparation and Dose.—Fluidextract, 1 to 8 ℥ (4 to 30 Cc.).

MALTUM.

Synonym.—Malt.

Botanical Name.—Hor'-de-um dis'-ti-chon (Barley). *Natural Order:* Gramineæ. *Habitat:* Asia, Africa, cultivated.

Part Used.—Partially germinated grain.

Description.—Yellowish or amber-colored grains, shading to brown; crisp when fractured; interior whitish or brown; agreeable, characteristic odor; sweetish taste.

Barley is soaked in water, put in heaps, allowed to heat and germinate, then dried to kill the embryo. The extract of malt is a brown-yellow liquid, consistency of honey. Diastase is an unorganized ferment from many plants, especially seeds,

being produced, during germination, from some other body in the seed. Obtained by making an aqueous extract of the fermenting grain, precipitating with alcohol, and drying. Occurs as a white, odorless, tasteless powder if fresh. It converts starch into dextrin and sugar. Taka-diastase is obtained from a mold of the aspergillus family which is grown on hydrolized wheat bran. It acts in acid, neutral, or alkaline solution. Taka-diastase is preferred to diastase.

Active Principles.—Diastase, Peptose, Sugar.

Action and Uses.—**Demulcent** and **nutritive** on account of the sugar; digestive and general **tonic**, on account of diastase; used in convalescence and where the natural ferment fails to digest starch. Best given about two hours after meals.

Preparations and Doses.—Fluidextract, 1 to 8 ℥ (4 to 30 Cc.). Diastase, 2 to 5 gr. (0.12 to 0.3 Gm.).

SABAL.

Synonym.—Saw-palmetto.

Botanical Name.—Se-re'-no-a ser-ru-la'-ta. *Natural Order:* Palmæ. *Habitat:* United States.

Part Used.—Partially dried ripe fruit.

Description.—Irregularly spherical to oblong ovoid; $\frac{2}{5}$ to 1 in. (1 to 2.5 Cm.) long, $\frac{2}{5}$ to $\frac{3}{5}$ in. (1 to 1.5 Cm.) in diameter; externally blackish brown, shriveled, somewhat oily; epicarp thin; sarcocarp greenish yellow, soft, spongy; endocarp thin, friable; seed hard, chocolate brown; odor aromatic, cheesy; taste sweetish, acrid, oily, disagreeable. Gathered chiefly in Florida from August to December; fruit is partially dried and put into barrels and a little alcohol added for preservation.

Active Principles.—Volatile oil, Fixed oil, Sugar.

Action and Uses.—Chiefly as a **sedative** in catarrhal and irritated conditions of the mucous membrane of the genito-urinary tract and in diseases of the glands of the reproductive organs; also used in bronchitis, phthisis. **Diuretic**, aphrodisiac, expectorant, tonic, narcotic.

Dose.—Fluidextract,* 1 to 2 ℥ (4 to 8 Cc.).

SAGO.*

Synonym.—Pearl sago.

Botanical Name.—Me-trox′-y-lon rum′-phi-i, and other palms. *Natural Order:* Palmæ. *Habitat:* East Indies.

Part Used.—Starch from pith of stems.

Description.—Usually roundish grains, white or brownish, hard; starch granules oval to ovate, indistinct rings around hylum. Pearl sago is generally partially cooked.

Active Principle.—Starch.

Action and Uses.—Similar to starch.

RESINA DRACONIS.*

Synonym.—Dragon's blood.

Botanical Name.—Cal′-a-mus dra′-co. *Natural Order:* Palmæ. *Habitat:* East Indies.

Part Used.—Resinous exudation.

Description.—Occurs in cylindrical sticks about 12 in. (30 Cm.) long, in tears, cakes, or globular masses; dark red brown, lighter red internally; fracture resinous, but irregular; odorless, but odor of benzoin when heated; nearly tasteless. Exudes from ripening fruit, from which it is shaken or brushed.

Active Principles.—Red resin, Benzoic acid.

Uses.—Chiefly in varnishes; formerly as astringent in plasters.

ARECA.*

Synonyms.—Areca nut, Betel nut.

Botanical Name.—A-re′-ca cat′-e-chu. *Natural Order:* Palmæ. *Habitat:* East Indies.

Part Used.—Seed.

Description.—Roundish, conical, or strawberry-shaped; 1 in. (25 Mm.) or less long, $\frac{3}{8}$ in. (9 Mm.) thick; grayish brown; broad, reddish, more or less spiral veins; white, horny inside; slightly aromatic odor; astringent taste. Seed

is enclosed in orange-colored fruit, resembling a small apple.

Active Principles.—Arecoline, Arecaine, Tannin.

Action and Uses.—**Vermifuge** for tapeworms and roundworms.

Dose.—Powdered drug, 2 to 4 ʒ (8 to 16 Gm.)

CALAMUS.

Synonyms.—Sweet flag, grass, cane, or myrtle.

Botanical Name.—Ac′-o-rus cal′-a-mus. *Natural Order:* Araceæ. *Habitat:* North temperate zone.

Part Used.—Unpeeled rhizome.

Description.—$\frac{2}{5}$ to $\frac{4}{5}$ in. (1 to 2 Cm.) thick, usually in longitudinally split pieces of various lengths; when entire, cylindraceous and somewhat vertically flattened; externally reddish brown, somewhat annulate from remnants of leaf sheaths; upper surface with triangular leaf scars, the lower surface with circular pitted scars of roots; fracture short, showing numerous oil cells and scattered fibrovascular bundles, the latter crowded within the endodermis; odor aromatic; taste pungent and bitter. The U. S. P. does not recognize the peeled rhizome, which is white and less aromatic. Collection should be made in the early spring.

Active Principles.—Volatile oil, Acorin.

Action and Uses.—Aromatic bitter **tonic** and carminative.

Preparation and Dose.—Fluidextract, 10 to 60 ♏ (0.6 to 4 Cc.).

ARUM.*

Synonyms.—Indian turnip, Wake robin, Jack-in-the-pulpit.

Botanical Name.—A-ri-sae′-ma tri-phyl′-lum. *Natural Order:* Araceæ. *Habitat:* North America.

Part Used.—Corm.

Description.—Usually in transverse slices or circular disks; nearly white, with brown, wrinkled epidermis attached;

short, starchy fracture; odorless; acrid taste, but not nearly as acrid as when fresh.

Active Principle.—Volatile acrid compound.

Action and Uses.—Fresh juice is **irritant** and vesicant and has been used for ringworm. The partially dried drug has been used as **expectorant** in chronic bronchitis, **carminative** in flatulent colic, diaphoretic.

Dose.—5 to 15 gr. (0.3 to 1 Gm.).

VERATRUM.

Synonyms.—(1) Green, Swamp, American, or False hellebore or veratrum. (2) European or White hellebore or veratrum.

Botanical Names.—(1) Veratrum viride. (2) V. album. *Natural Order:* Liliaceæ. *Habitat:* (1) North America. (2) Europe.

Parts Used.—Rhizome and roots.

Description.—Ovoid or obconical, usually cut longitudinally, 1 to 3 in. (2.5 to 7 Cm.) long and $\frac{4}{5}$ to 2 in. (2 to 5 Cm.) thick; externally light to dark brown or blackish, frequently bearing at the summit some coarsely fibrous remains of leaf bases; internally grayish or yellowish white, showing numerous short, irregular wood bundles. Roots emanating from all sides of the rhizome, numerous, shrivelled, whitish or light yellowish brown. Inodorous, but strongly sternutatory when powdered; taste bitterish and very acrid. It is difficult and often impossible to distinguish one species from the other. The drug should not be kept longer than a year.

Active Principles.—Protoveratrine, Jervine, Rubijervine, Pseudojervine, Cevadine.

Action and Uses.—Veratrum quite closely resembles aconite. *External:* Prickling, then numbing sensation; inhaled causes sneezing and coughing. *Alimentary canal:* Produces nausea, and vomiting comes early when taken in large doses, so there is less danger of fatal results. *Circulation:* Force is lessened and the heart slowed; blood pressure is very much reduced. Physicians differ in opinion as to the value; it is

generally agreed that it is good in puerperal eclampsia, but must be given in large doses (20 to 30 ♏ of fluidextract), followed by smaller ones. It is a **sedative** to the nervous, respiratory, and circulatory systems; sometimes given in fevers, but should then be given only in the first stages; given in palpitation of the heart. It is a **diaphoretic**, due to cutaneous relaxation.

Preparations and Doses.—Fluidextract, 1 to 4 ♏ (0.06 to 0.25 Cc.). Tincture, 10 to 30 ♏ (0.6 to 2 Cc.). Norwood's tincture,* 5 ♏ (0.3 Cc.), slowly increased.

SABADILLA.*

Synonym.—Cevadilla.

Botanical Name.—A-sa'-grae-a of-fi-ci-na'-lis. *Natural Order:* Liliaceæ. *Habitat:* Mexico.

Part Used.—Seed.

Description.—Narrow, fusiform, $\frac{1}{5}$ to $\frac{1}{3}$ in. (5 to 8 Mm.) long, angular, short ridge along concave side, wrinkled; brownish black, internally whitish, odorless, but sternutatory; bitter, acrid taste.

Active Principles.—Official veratrine, which is a mixture of alkaloids: Veratrine, Cevadine, Cevadilline, Sabadine, Sabadilline.

Action and Uses.—Practically identical with veratrum. Sabadilla is rarely used and official veratrine is not often given internally. Externally veratrine is used as **sedative** for neuralgia, myalgia, chronic swelling of joints, and painful affections; internally it has been used in fevers, dropsies, and nervous diseases. *Toxicology:* Symptoms and treatment similar to aconite.

Preparations and Doses.—Veratrine, $\frac{1}{50}$ to $\frac{1}{10}$ gr. (0.0013 to 0.06 Gm.). Ointment. Oleate.

SCILLA.

Synonyms.—Squill, Sea-onion.

Botanical Name. — Ur-gin'-e-a ma-rit'-i-ma. *Natural Order:* Liliaceæ. *Habitat:* Mediterranean Basin.

Part Used.—Bulb deprived of dry, outer, membranaceous scales, cut into thin slices, rejecting central portion.

Description.—In irregular, curved, flat, narrow, somewhat translucent, yellowish-white or reddish-white segments, 1 to 2 in. (2.5 to 5 Cm.) long; brittle and pulverizable when dry; tough and flexible when damp; odor slight; taste mucilaginous, bitter, and acrid. The bulb is pear-shaped, sometimes weighing several pounds; difficult to dry; may be white or red; both active, but the white preferred because of colorless preparations.

Active Principles.—Scillin, Scillipicrin, Scillitoxin.

Action and Uses.—Somewhat resembles digitalis, but used more often as an expectorant and diuretic. *Alimentary canal:* More irritating than digitalis; small doses may cause nausea and vomiting. *Circulation:* Like digitalis, but less active. *Respiratory tract:* Irritates mucous membrane; **expectorant**, used in bronchitis where sputa is tenacious, scanty, or very excessive; in croup, whooping-cough, asthma. *Kidneys:* Renal circulation is increased and kidneys are stimulated; **diuretic**, for dropsy of cardiac origin or where kidneys are not inflamed; may be given with digitalis or saline salts. Large and toxic doses cause gastro-enteritis, suppression of urine, strangury, stupor, convulsions, and paralysis of the heart.

Preparations and Doses.—Fluidextract, 1 to 5 ♏ (0.06 to 0.3 Cc.). Tincture and Vinegar, 5 to 30 ♏ (0.3 to 2 Cc.). Syrup, 15 to 60 ♏ (1 to 4 Cc.). Compound syrup, as emetic for children or expectorant for adults, 10 to 45 ♏ (0.6 to 3 Cc.).

ALLIUM.*

Synonym.—Garlic.

Botanical Name.—Al′-li-um sa-ti′-vum. *Natural Order:* Liliaceæ. *Habitat:* Asia, cultivated.

Part Used.—Fresh bulb.

Description.—Subglobular, 1 to 2 in. (2.5 to 5 Cm.) thick, covered by membranous scales, several small bulbs around the base; pungent, disagreeable odor; warm, acrid taste. Allium cepa (onion) and Allium porrum (leek) resemble garlic.

Active Principle.—Volatile oil.

Action and Uses.—Irritant and **counterirritant**; used as a poultice to the chest in bronchitis, to the spine in infantile convulsions. **Expectorant**, carminative, condiment, stimulant.

Preparations and Doses.—Oil, 2 to 5 ♏ (0.12 to 0.3 Cc.). Syrup, 1 to 2 ℥ (4 to 8 Cc.).

ALOE.

Synonyms.—Aloes. (1) Barbadoes, Hepatic, or Horse aloes. (2) Curaçao aloes. (3) Socotrine aloes.

Botanical Names.—(1) Al′-o-e ve′-ra. (2) A. chi-nen′-sis. (3) A. per′-ry-i. *Natural Order:* Liliaceæ. *Habitat:* (1) Africa, India, Barbadoes Islands. (2) India, cultivated in Curaçao. (3) East Africa, Socotra Island.

Part Used.—Inspissated juice of leaves. *Adulterants:* Aloes from inferior species, thick juice from leaves, sticks, stones.

Description.—In yellowish-brown or orange-brown to blackish-brown, opaque masses; translucent in thin fragments; fracture uneven, dull and waxy, somewhat resinous, or smooth and glassy, somewhat conchoidal; occasionally exhibiting microscopic crystals of aloin; odor characteristic; taste nauseous, bitter.

Barbadoes now furnishes but little aloes, some of the so-called Barbadoes aloes being the Curaçao aloes; the two are often described together. The Barbadoes aloes is a little

darker than the Socotrine aloes, has a little more lustre, and a stronger, more disagreeable odor when breathed upon. They can be distinguished by chemical tests. The Socotrine aloes is the more expensive and generally preferred; has a saffron-like odor. Cape aloes (Aloe spicata, from Cape of Good Hope) and Natal aloes (from Natal) are sometimes found on the market.

Aloes is obtained by cutting or breaking the leaves off near their bases, standing them in a slanting position so that the thin juice in the outer part of the leaf will run out before the thicker juice of the inner part, which is less active, exudes. The juice at first is colorless, but changes on exposure. Evaporation may be by artificial heat or spontaneous.

Aloe purificata (U. S. P.) occurs in irregular, brittle pieces, of a dull-brown or reddish-brown color. The powder is of a yellow-brown color. The purification is entirely mechanical, freeing the aloes from foreign matter too large to pass through a No. 60 sieve.

Active Principles.—Aloin, Emodin.

Action and Uses.—External: May be absorbed through abraded surface or mucous membrane. *Alimentary canal:* Stimulates contraction of large intestine, particularly lower part, and increases secretion; secretion of bile is probably increased; acts slowly, 10 to 15 hours being required; causes griping and is usually combined with other drugs and carminatives; bile and soap increase its action. Generally not necessary to increase the dose on continued administration; continued use may cause hemorrhoids, and it should not be given where active hemorrhoids exist. Used as a **purgative** in chronic constipation; given with iron in chlorosis; bitter **stomachic** in atonic dyspepsia; **anthelmintic,** by enema, for round-worms. *Uterus:* Causes congestion; **emmenagogue** in amenorrhea and some cases of menorrhagia; may tend to produce abortion and should be given with caution in some cases of pregnancy. *Elimination:* By bowels, kidneys, and in milk; taken by a nursing mother may affect the child.

Preparations and Doses.—Purified aloes, 1 to 5 gr. (0.06 to 0.3 Gm.), sometimes as high as 20 gr. (1.3 Gm.). Extract, 1 to 5 gr. (0.06 to 0.3 Gm.). Tincture and Tincture aloes and

myrrh, 15 to 60 ♏ (1 to 4 Cc.). Pills, Pills aloes and iron, Pills aloes and mastic, Pills aloes and myrrh, Compound laxative pills; also an ingredient in some other preparations. Aloin, $\frac{1}{4}$ to 2 gr. (0.015 to 0.12 Gm.).

CONVALLARIA.

Synonym.—Lily of the valley.

Botanical Name.—Con-val-la'-ri-a ma-ja'-lis. *Natural Order:* Liliaceæ. *Habitat:* Europe (chiefly), Asia, North America.

Parts Used.—Rhizome and roots.

Description.—Rhizome of horizontal growth, somewhat branched, length variable, cylindrical, whitish or pale brown; marked with few circular stem scars and at each joint with a circle of root scars or thin, tortuous, and branched roots; fracture fibrous but weak, internally whitish; odor distinct; taste sweetish, bitter, and slightly acrid.

Active Principles.—Convallamarin, Convallarin.

Action and Uses.—Like digitalis. Not so powerful as digitalis, often unreliable, not cumulative.

Preparations and Doses.—Fluidextract, 2 to 10 ♏ (0.12 to 0.6 Cc.). Convallamarin,* $\frac{1}{2}$ to 2 gr. (0.03 to 0.12 Gm.).

1. COLCHICI CORMUS. 2. COLCHICI SEMEN.

Synonyms.—(1) Colchicum corm or root. (2) Colchicum seed. Of plant, Meadow saffron, Upstart.

Botanical Name.—Col'-chi-cum au-tum-na'-le. *Natural Order:* Liliaceæ. *Habitat:* Europe.

Parts Used.—Corm, Seed.

Description.—Corm: Ovoid, somewhat compressed laterally, and with a groove on one side, or more commonly in transverse, reniform, or longitudinal, ovate slices; externally brownish and finely wrinkled; internally whitish, with numerous circular groups of fibrovascular bundles, giving the surfaces of the transverse sections a papillose appearance;

fracture short, mealy; odor slight; taste sweetish, bitter, and somewhat acrid. Should be collected when one year old. SEED: Subglobular, about $\frac{1}{12}$ in. (2 Mm.) in diameter, very slightly pointed at the hilum; externally reddish brown, finely pitted; internally whitish; tough and of almost bony hardness; nearly inodorous; taste bitter and somewhat acrid.

Active Principles.—Colchicine. U. S. P. requires the corm to contain not less than 0.35 per cent. and the seed not less than 0.45 per cent.

Action and Uses.—**Alterative**, chiefly for gout and gouty conditions, largely used empyrically; must be given in as large doses as the patient can bear; slightly increases elimination of uric acid; colchicine may act better than the drug. Small doses have but little effect except to increase secretions. Large doses cause nausea, vomiting, purging, thirst, salivation, prostration, apathy, death. Symptoms of poisoning may not commence for two hours. Give emetics, cathartics, water to flush kidneys, tannic acid, opium for pain, stimulants for depression

Preparations and Doses.—Extract of corm, $\frac{1}{2}$ to 2 gr. (0.03 to 0.13 Gm.). Fluidextract of seed, 1 to 5 ♏ (0.06 to 0.3 Cc.). Tincture and Wine of seed, 10 to 60 ♏ (0.65 to 4 Cc.). Colchicine, $\frac{1}{150}$ to $\frac{1}{100}$ gr. (0.0004 to 0.0006 Gm.).

SARSAPARILLA.

Synonym.—Sarsaparilla.

Botanical Names.—(1) Smi′-lax of-fi-ci-na′-lis. (2) S. or-na′-ta. (3) S. med′-i-ca. (4) S. pap-y-ra′-ce-a. *Natural Order:* Liliaceæ. *Habitat:* (1) Honduras. (2) Jamaica, Central America, Costa Rica. (3) Mexico. (4) Brazil.

Part Used.—Root.

Description.—Usually more than 3 feet (1 M.) in length, and $\frac{1}{6}$ to $\frac{1}{4}$ in. (4 to 6 Mm.) thick, with few or many fine roots adhering; externally varying from light gray brown and smooth, with few deep and sharp wrinkles, to dark or orange brown and less smooth, and with more and smaller wrinkles; internally whitish, with a thick, mealy, or some-

times horny cortex, a circular wood zone, and a thick pith; fracture tough; nearly inodorous; taste mucilaginous, somewhat sweetish and bitter, slightly acrid.

The thick, woody, knotty rhizome, if present, should be removed.

Honduras sarsaparilla, which is generally preferred, occurs in rolls $2\frac{1}{2}$ to 3 feet long, wound round with a root. Jamaica occurs in rolls, but looser than the Honduras. Mexican comes in bales or loose bunches with one end larger than the other; roots attached to rhizome. Brazilian occurs in tight rolls entirely covered with the binding root; ends of rolls are cut off.

Active Principles.—Parillin (parillic acid), Sarsasaponin.

Action and Uses.—Considered by some to be **alterative, tonic, diuretic, diaphoretic**; by others to be inert. May perhaps increase activity of other alteratives, as mercury and iodides in syphilitic troubles. It is an unimportant ingredient in sarsaparilla blood purifiers.

Preparations and Doses.—Fluidextract and Compound fluidextract, 30 to 60 ♏ (2 to 4 Cc.). Compound syrup, 1 to 8 ℥ (4 to 30 Cc.).

ALETRIS.*

Synonyms.—Unicorn root, Colic root, Starwort, Ague root, Blazing star.

Botanical Name.—Al-e′-tris far-i-no′-sa. *Natural Order:* Liliaceæ. *Habitat:* United States.

Part Used.—Rhizome.

Description.—Gray brown externally, whitish internally, about 1 in. (2.5 Cm.) long and $\frac{1}{8}$ in. (3 Mm.) thick, upper side flattened, indistinct joints, fracture short, odorless, starchy taste.

Active Principles.—Starch, Bitter principle.

Action and Uses.—Simple **bitter**. Claimed to be tonic, emetic, cathartic, carminative, uterine tonic, antirheumatic.

Dose.—5 to 10 gr. (0.3 to 0.6 Gm.).

IRIS.*

Synonyms.—Blue flag, Water flag, Flag lily.

Botanical Name.—I′-ris ver-sic′-o-lor. *Natural Order:* Iridaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots.

Description.—Rhizome 2 to 4 in. (5 to 10 Cm.) long, jointed, cylindrical in the lower half, flattish near the upper end, terminated by a circular scar, annulated, grayish brown; roots long, simple, crowded near the flattened end; slight but characteristic odor; nauseous, acrid taste.

Active Principle.—Resin.

Action and Uses.—**Hydragogue** and **cholagogue**, considered by some to approach podophyllum; used in constipation, malarial jaundice, bilious remittent fever. **Diuretic** in dropsy.

Preparations and Doses.—Fluidextract, 5 to 20 ♏ (0.3 to 1.3 Cc.). Iridin, 1 to 4 gr. (0.06 to 0.25 Gm.).

IRIS FLORENTINA.*

Synonyms.—Orris root, White flag.

Botanical Name.—I′-ris flor-en-ti′-na. *Natural Order:* Iridaceæ. *Habitat:* Europe.

Part Used.—Rhizome.

Description.—Flattened joints, 2 to 4 in. (5 to 10 Cm.) long, stem scar at large end, root scars underneath, peeled, white or yellowish white, mealy, fracture short; odor suggestive of violets; bitter, slightly acrid taste.

Active Principle.—Volatile oil.

Uses.—Rings or pieces are used for teething infants; ingredient in tooth powders; making violet perfumes; perfuming the breath; has been used as sialagogue and diuretic.

CROCUS.*

Synonyms.—Saffron, Spanish or True saffron.

Botanical Name.—Cro'-cus sa-ti'-vus. *Natural Order:* Iridaceæ. *Habitat:* Europe, Asia.

Part Used.—Stigmas. *Adulterants:* Styles, oil, mineral matter, coal-tar colors, glycerin.

Description.—Separate stigmas, or three, attached to the top of the style; about 1 in. (2.5 Cm.) long; flattish-tubular, thread-like, funnel-shaped, and notched above; orange brown; odor strong and peculiar; taste aromatic and bitter. Requires about 4000 flowers to get one ounce of stigmas.

Active Principles.—Volatile oil, Crocin.

Action and Uses.—Not used much now. Formerly highly esteemed as **antispasmodic** in asthma and spasmodic cough; **emmenagogue** in dysmenorrhea; sometimes used in dyspepsia; coloring agent.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

CARDAMOMUM.

Synonym.—Cardamom.

Botanical Name.—El-et-ta'-ri-a re'-pens. *Natural Order:* Zingiberaceæ. *Habitat:* India (particularly Malabar).

Part Used.—Nearly ripe fruit. *Adulterants:* Other fruits, orange seeds, ginger.

Description.—Oblong ovoid, obtusely triangular in transverse section, from $\frac{2}{5}$ to $\frac{4}{5}$ in. (10 to 20 Mm.) long, slightly beaked at the apex, rounded to truncate at the base; three-celled with central placentæ; pericarp thin, leathery; nearly tasteless, and of a pale-yellow color; seeds 15 to 18 in number, oblong ovoid and irregularly angular, reddish brown, enclosed in a thin, membranous aril; odor and taste strongly and agreeably aromatic. The seeds alone contain active and valuable constituents. Fruit is gathered just before ripening, as it is not so likely to crack open; bleached by moisture and light or sulphurous acid.

Active Principle.—Volatile oil.

Action and Uses.—Stomachic, carminative, **flavoring** agent, particularly for saline salts.

Preparations and Doses.—Tincture and Compound tincture, 30 to 60 ♏ (2 to 4 Cc.).

ZINGIBER.

Synonyms.—Ginger; Black, African, White, or Peeled ginger.

Botanical Name.—Zin′-gi-ber of-fi-ci-na′-le. *Natural Order:* Zingiberaceæ. *Habitat:* Asia, Africa, Jamaica.

Part Used.—Rhizome. *Adulterant:* Exhausted ginger.

Description.—Flattened, irregularly branched pieces; externally whitish or pale buff, longitudinally striate; fracture short-fibrous, mealy, showing numerous small oil and resin cells and circular groups of fibrovascular bundles; odor agreeably aromatic; taste aromatic and pungent.

Peeled or white ginger consists of rhizomes which have been washed, scraped, and then slowly dried; fine flavor, but much weaker. Coated or black ginger is composed of rhizomes which have been dipped into boiling water for a few minutes to prevent subsequent germination. Bleached ginger has been dipped into milk of lime or chlorinated lime which conceals defects and prevents the attack of insects; sometimes bleached by sulphur dioxide. Jamaica ginger, generally preferred in this country, has the periderm removed; African is coated or has periderm removed from sides; Chinese, Cochin, and East Indian gingers resemble the African.

Active Principles.—Volatile oil, Gingerol.

Action and Uses.—External: Rubefacient and **counter-irritant**, for colic, headache, neuralgia; inhaled produces sneezing. *Internal:* Masticatory, **tonic** in dyspepsia, **carminative** to relieve colic and griping of purgatives, ingredient in many diarrhea mixtures, **flavoring** agent in the form of the syrup, **diaphoretic** in the form of a hot infusion.

Preparations and Doses.—Fluidextract, 10 to 30 ♏ (0.65 to 2 Cc.). Tincture, 10 to 60 ♏ (0.65 to 4 Cc.). Syrup, 1 to 8 ♃ (4 to 30 Cc.). Oleoresin, ½ to 1 gr. (0.03 to 0.06 Gm.).

GALANGA.*

Synonyms.—Galangal, Chinese ginger.

Botanical Name.—Al-pin′-i-a of-fi-ci-na′-rum. *Natural Order:* Zingiberaceæ. *Habitat:* China.

Part Used.—Rhizome.

Description.—Cylindrical, branched, 2 to 3 in. (5 to 7 Cm.) long, thick; whitish, annular rings; rust brown externally, lighter internally, getting darker on exposure; fracture short; scattered resin cells; odor and taste aromatic and suggestive of ginger.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Stimulant and aromatic, similar to ginger.

Dose.—15 to 30 gr. (1 to 2 Gm.).

MARANTA.*

Synonym.—Arrow-root.

Botanical Name.—Ma-ran′-ta a-run-di-na′-ce-a. *Natural Order:* Marantaceæ. *Habitat:* West Indies, Tropics.

Part Used.—Starch from rhizome. *Adulterants:* Other starches.

Description.—Powder or lumps; white, oval granules with rings around the fissured hilum, which is at the large end. Burmuda starch is best.

Uses.—Food for infants and invalids; **demulcent** in inflammation of alimentary canal.

CURCUMA.*

Synonym.—Tumeric.

Botanical Name.—Cur′-cu-ma lon′-ga. *Natural Order:* Marantaceæ. *Habitat:* Asia, Africa.

Part Used.—Rhizome.

Description.—Two kinds, one nearly round, the other 1 to 2 in. (2.5 to 5 Cm.) long and ½ in. (1.2 Cm.) thick. The longer variety is somewhat tapering, annulate, straight or

contorted; yellowish gray externally, orange yellow to dark red brown internally; fracture short with waxy lustre; the round is somewhat flattened, pear-shaped; slight peculiar odor; pungent, bitter taste. Powder is deep yellow.

Active Principles.—Volatile oil, Curcumin.

Uses.—Chiefly as a coloring agent and indicator. Aromatic stimulant, but rarely used in medicine.

ZEDOARIA.*

Synonym.—Zedoary.

Botanical Name.—Cur′-cu-ma zed-o-a′-ri-a. *Natural Order:* Marantaceæ. *Habitat:* Asia.

Part Used.—Rhizome.

Description.—Transverse slices, $\frac{1}{2}$ to $1\frac{1}{2}$ in. (12 to 37 Mm.) in diameter, $\frac{1}{6}$ to $\frac{2}{5}$ in. (4 to 10 Mm.) thick; grayish white to grayish brown, with edges of grayish brown; resin cells numerous; fracture short; odor and taste resembling ginger.

Active Principles.—Volatile oil, Resin.

Uses.—Similar to ginger.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

CYPRIPEDIUM.

Synonyms.—Ladies' slipper, Moccasin plant, Venus' shoe, American valerian.

Botanical Names.—Cyp-ri-pe′-di-um hir-su′-tum. C. par-vi-flo′-rum. *Natural Order:* Orchidaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots.

Description.—Rhizome of horizontal growth, curved, 1 to 4 in. (3 to 10 Cm.) long, $\frac{1}{12}$ to $\frac{1}{4}$ in. (2 to 6 Mm.) thick, orange brown to dark brown, the upper side beset with numerous circular, cup-shaped scars, closely covered below with simple wiry, matted roots; fracture of rhizome short, white; that of roots somewhat fibrous; odor distinct, heavy, valerian-like; sweetish-bitter, pungent taste.

Active Principle.—Volatile oil.

Action and Uses.—Similar to valerian. **Antispasmodic** for hysteria, chorea, epilepsy, nervousness.

Preparation and Dose.—Fluidextract, 15 to 30 ♏ (1 to 2 Cc.).

VANILLA.

Synonym.—Vanilla.

Botanical Name.—Va-nil'-la plan-i-fo'-li-a. *Natural Order:* Orchidaceæ. *Habitat:* Mexico, cultivated.

Part Used.—Cured, full-grown, but immature fruit. *Adulterants:* Poor beans, removal of vanillin, oiling, splits.

Description.—Linear, narrowed, and bent or hooked at the rather oblique base; about 6 to 10 in. (15 to 25 Cm.) long and about $\frac{1}{3}$ in. (7 Mm.) thick; externally blackish brown, longitudinally wrinkled, glossy, frequently covered with an efflorescence of vanillin in acicular crystals, flexible and tough, 1-celled, containing a blackish-brown pulp and numerous minute, blackish, ovoid, and flattened seeds; odor and taste characteristic and very agreeable.

The odorless fruit, 3 to 10 beans in a cluster, is collected before fully mature, when changing from green to yellow, so as to avoid splitting; several months are required for curing. The fruit is placed in heaps and partially fermented, then alternately sweated in boxes or under blankets and dried in the sun until it becomes brown and the odor is developed. The odor is due to vanillin, which is formed from coniferin by hydrolization and the action of a ferment. The beans are then sorted and tied up in bunches according to length and quality. The Mexican is best, but the Bourbon is gaining in reputation. Vanillin comes from the beans or is made synthetically.

Active Principle.—Vanillin.

Action and Uses.—Chiefly as a flavoring agent. Said to be irritant, carminative, aphrodisiac.

Preparations and Doses.—Vanillin, $\frac{1}{4}$ to 1 gr. (0.015 to 0.06 Gm.). Tincture.

SALEP.*

Synonym.—Salep.

Botanical Name.—Or'-chis mas-cu'-la, and other species. *Natural Order:* Orchidaceæ. *Habitat:* Europe.

Part Used.—Tuber.

Description.—Globular, more generally oblong, about 1 in. (2.5 Cm.) long, flattened or wrinkled, deprived of epidermis, brownish yellow, translucent, horny, odorless, mucilaginous taste. Tubers sometimes branched.

Active Principles.—Mucilage, Starch.

Action and Uses.—Nutritive, **demulcent** to the alimentary canal.

CUBEBA.

Synonyms.—Cubeb, Tailed peper.

Botanical Name.—Pi'-per cu-be'-ba. *Natural Order:* Piperaceæ. *Habitat:* East Indies.

Part Used.—Unripe but fully grown fruit. *Adulterants:* Stalk, black peper, fruit of Rhamnus cathartica.

Description.—From $\frac{2}{5}$ to $\frac{1}{2}$ in. (10 to 13 Mm.) long, the upper portion globoidal, $\frac{1}{6}$ to $\frac{1}{5}$ in. (4 to 5 Mm.) in diameter, contracted at the base into a slender, stem-like portion; pericarp reticulately wrinkled, blackish gray; internally light brown, smooth, oily, one-seeded; brittle; of a strongly aromatic, somewhat camphoraceous odor and taste. Fruit is gathered while still green. The plant is a climbing vine, often cultivated in coffee plantations.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Similar to copaiba, but less irritating. *Alimentary canal:* **Stomachic, carminative;** used in catarrh of the colon and rectum; large doses may cause indigestion, nausea, and vomiting. *Circulation:* Cardiac stimulant. *Respiratory tract:* **Expectorant,** increasing and disinfecting secretions; used in nasal catarrh, hay fever, asthma (cubeb cigarettes), bronchitis, by public speakers (troches). *Genito-urinary tract:* **Diuretic,** increases and disinfects urine, imparting a peculiar odor; large doses may cause albuminuria and

hematuria; used in gonorrhea, gleet, cystitis, nocturnal incontinence of urine. *Skin:* **Diaphoretic,** may irritate and cause eruption; some persons are very susceptible. *Elimination:* By the kidneys, bronchial mucous membrane, and skin.

Preparations and Doses.—Fluidextract, 5 to 30 ♏ (0.3 to 2 Cc.). Oleoresin and Oil, 5 to 20 ♏ (0.3 to 1.3 Cc.). Troches.

PIPER.

Synonyms.—Pepper, Black pepper.

Botanical Name.—Pi′-per ni′-grum. *Natural Order:* Piperaceæ. *Habitat:* East Indies,

Part Used.—Dried, unripe fruit. *Adulterants:* Other fruits, starch, mustard, linseed, capsicum, shells, coloring matter; best detected by the microscope.

Description.—Nearly globular, $\frac{1}{6}$ to $\frac{1}{5}$ in. (4 to 5 Mm.) in diameter, externally brownish or grayish black; pericarp thin, coarsely wrinkled, enclosing a single, whitish, more or less imperfectly developed seed; odor strong, penetrating, provoking sneezing; taste aromatic and very pungent.

Fruit is green, then red, and yellow when ripe; collected while changing from green to red because of less wastage and greater strength. Several varieties exist: Singapore, Penang, Malabar; these are sometimes mixed.

Piper album.* White pepper comes from Piper nigrum. Generally the fruit is allowed to become very nearly ripe, then the outer part removed by rubbing before it is dry; usually larger than black pepper, but less active. Sometimes other treatment is used and the berry is smaller than the black.

Active Principles.—Volatile oil, Piperine, Resin.

Action and Uses.—External: **Irritant,** used in ringworm; **counterirritant** used as a gargle in relaxed throat and gums, as a poultice in colic and rheumatism. *Alimentary canal:* Chiefly as **condiment.** *Genito-urinary tract:* Disinfectant and **stimulant** in case of atony. Piperine is a rather feeble antipyretic and antiperiodic in malaria.

Preparations and Doses.—Oleoresin, $\frac{1}{4}$ to 1 gr. (0.015 to 0.06 Gm.). Piperine, 1 to 5 gr. (0.06 to 0.3 Gm.).

PIPER LONGUM.*

Synonyms.—Long or Elephant pepper.

Botanical Name.—Pi′-per of-fi-ci-na′-rum. *Natural Order:* Piperaceæ. *Habitat:* East Indies.

Part Used.—Immature fruit.

Description.—Nearly cylindrical, spike-like cones, 1 to 1½ in. (2.5 to 3.8 Cm.) long, ⅛ to ¼ in. (3 to 6 Mm.) thick, spirally arranged partly coalesced fruits, blackish gray; odor, taste, active principles, action and uses, similar to black pepper.

MATICO.

Synonym.—Matico.

Botanical Name.—Pi-per an-gus-ti-fo′-li-um. *Natural Order:* Piperaceæ. *Habitat:* Tropical America.

Part Used.—Leaves. *Adulterants:* Leaves of other species.

Description.—From 4 to 6 in. (10 to 15 Cm.) long, short-petiolate, oblong lanceolate; apex pointed, base unequally heart-shaped, margin very finely crenulate; tessellated above, reticulate beneath, the meshes small, and the veins densely brownish-hairy; aromatic, spicy, bitterish, and astringent.

Active Principles.—Volatile oil, Tannin, Bitter principle.

Action and Uses.—Similar to cubebs. Local **styptic,** the hairs aiding the clotting mechanically. Aromatic **tonic, astringment** in chronic diarrhea, hemostatic. **Expectorant** in bronchitis; **stimulant** in catarrh of the urinary tract; **antiseptic** in gonorrhea; aphrodisiac.

Preparation and Dose.—Fluidextract, ½ to 2 ℥ (2 to 8 Cc.).

METHYSTICUM.*

Synonyms.—Kava-kava, Ava.

Botanical Name.—Pi′-per meth-ys′-ti-cum. *Natural Order:* Piperaceæ. *Habitat:* Sandwich Islands.

Part Used.—Root.

Description.—Large, knotty crown, branched, usually in segments; spongy wood, tough and fibro-vascular, blackish-brown bark, lighter internally; odor slight but fragrant; taste pungent and acrid.

Active Principles.—Resins.

Action and Uses.—Locally produces tingling and anesthesia. Used chiefly in treatment of diseases of genito-urinary tract. A fermented drink made by natives produces intoxication.

Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

JUGLANS.*

Synonym.—Butternut.

Botanical Name.—Ju'-glans cin-e'-re-a. *Natural Order:* Juglandaceæ. *Habitat:* North America.

Part Used.—Bark of root. *Adulterant:* Bark of stem.

Description.—Flat or curved pieces, about $\frac{1}{5}$ in. (5 Mm.) thick; outer surface dark brown, deprived of soft cork; inner surface smooth, striate, brown; fracture short and checkered, fibrous; odor slight; taste bitter somewhat pungent. Black walnut bark (Juglans nigra) resembles butternut.

Active Principles.—Juglandic acid.

Action and Uses.—Mild **cathartic** without pain, resembling rhubarb: used both in dysentery and chronic constipation.

Preparation and Dose.—Extract, 5 to 30 gr. (0.3 to 2 Gm.).

SALIX.*

Synonym.—White willow.

Botanical Name.—Sa'-lix al'-ba. *Natural Order:* Salicaceæ. *Habitat:* Europe, North America.

Part Used.—Bark.

Description.—Thin fragments or quills, tough, externally brownish gray; underneath this is a thin, greenish layer, and underneath this is another, brownish layer; odorless; bitter taste.

Active Principles.—Salicin.

Action and Uses.—Willow bark is rarely used in medicine but salicin is quite often prescribed. Salicin is a bitter **tonic** and **antiseptic** in fermentative dyspepsia; **antiperiodic** and **antipyretic** in intermittent and rheumatic fevers; chiefiy used as a substitute for salicylic acid in rheumatism; it is less likely to cause indigestion and depression of the heart, but is slower and less effective.

Dose.—Salicin (U. S. P.), 5 to 30 gr. (0.3 to 2 Gm.).

POPULUS CANDICANS.*

Synonym.—Balm of Gilead buds.

Botanical Name.—Pop′-u-lus can′-di-cans. *Natural Order:* Salicaceæ. *Habitat:* North America, Asia.

Part Used.—Leaf buds.

Description.—Single or 2 or 3 united at the base, $\frac{1}{2}$ to $1\frac{1}{2}$ in. (1.2 to 3.7 Cm.) long, sharply pointed, somewhat flattened, dark brown; consists of thick, imbricated scales covered with resinous matter enclosing small catkins; balsamic odor and taste.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Similar to other terebinthinate compounds; chiefly as an **expectorant** and stimulant to skin diseases.

Dose.—15 to 60 gr. (1 to 4 Gm.).

QUERCUS.

Synonyms.—White oak, Stone oak.

Botanical Name.—Quer′-cus al′-ba. *Natural Order:* Cupuliferæ. *Habitat:* North America.

Part Used.—Bark from trunk or branches 10 to 25 years old, and deprived of the periderm.

Description.—In nearly flat pieces, $\frac{1}{12}$ to $\frac{2}{5}$ in. (2 to 10 Mm.) thick; externally light brown, becoming darker with age, rough, fibrous; fracture uneven, coarsely fibrous; odor dis-

tinct, taste strongly astringent; not tingeing the saliva yellow when chewed. There is a large number of oaks, the barks of which are used for the tannin as, Q. velutina (Black, Scarlet, or Dyer's oak); Q. robur (European or English oak); Q. marylandica (Black or Iron oak, Black Jack); Q. suber (Cork oak).

Active Principle—Tannin.

Action and Uses.—Similar to tannic acid; not often used.

Preparation and Dose.—Fluidextract, 5 to 20 ♏ (0.3 to 1.3 Cc.).

GALLA.

Synonyms.—Nutgall, Galls.

Botanical Name.—Quer'-cus in-fec-to'-ri-a. *Natural Order:* Cupuliferæ. *Habitat:* Mediterranean Basin, Asia Minor.

Part Used.—Excresence caused by stings of an insect.

Description.—Subglobular, $\frac{2}{5}$ to $\frac{4}{5}$ in. (1 to 2 Cm.) in diameter, externally blackish olive green or blackish gray, more or less tuberculated above, the basal portion nearly smooth and contracted into a short stalk, sometimes with a perforation on one side, heavy, fracture horny, yellowish or grayish; in the centre a cavity containing either the partly developed insect, or pulverulent remains left by it; nearly inodorous; taste strongly astringent.

The tender bark of a branch is punctured by the insect and one or more ova deposited; irritation causes the formation of abnormal tissue which envelops the larva; galls should be collected before the insect formed from the larva eats its way out, otherwise the gall will be deficient in tannin. Alleppo or Turkish galls are considered the best.

Active Principles.—Tannic acid, Gallic acid.

Action and Uses.—Nutgall has been replaced by tannic and gallic acid, though it is occasionally used in the form of an ointment for hemorrhoids.

Preparations and Doses.—5 to 10 gr. (0.3 to 0.6 Gm.). Tincture, $\frac{1}{2}$ to 3 ℥ (2 to 12 Cc.).

CASTANEA.*

Synonym.—Chestnut.

Botanical Name.—Cas-ta′-ne-a den-ta′-ta. *Natural Order:* Fagaceæ. *Habitat:* North America.

Part Used.—Leaves.

Description.—About 6 to 10 in. (15 to 25 Cm.) long, and 2 in. (5 Cm.) wide, oblong, lanceolate, acuminate, feather-veined, sinuate-serrate, smooth, dark green above, lighter green beneath; slight odor; astringent taste.

Active Principle.—Tannin.

Action and Uses.—Sedative and astringent, used chiefly in whooping-cough.

Preparation and Dose.—Fluidextract, 15 to 60 m. (1 to 4 Cc.).

ULMUS.

Synonyms.—Elm, Slippery, Red, or Moose elm.

Botanical Name.—Ul′-mus ful′-va. *Natural Order:* Ulmaceæ. *Habitat:* North America.

Part Used.—Bark deprived of its periderm. *Adulterants:* Powder is subject to mixture with starch or flour.

Description.—In flat pieces varying in length and width, $\frac{1}{8}$ to $\frac{1}{6}$ in. (3 to 4 Mm.) thick; outer surface light brown, with occasional dark-brown patches of the periderm; inner surface yellowish brown; fracture fibrous and somewhat mealy; odor slight but distinct; taste mucilaginous. Should be collected in the spring.

Active Principle.—Mucilage.

Action and Uses.—**Demulcent** for laryngitis, pharyngitis, bronchitis, diarrhea, dysentery, inflammation of the urinary tract; **emollient** for abscesses, felons, and local inflammations; **diuretic,** uterine tent.

Preparation and Dose.—Mucilage, $\frac{1}{2}$ to 2 ℥ (15 to 60 Cc.).

FICUS.

Synonym.—Fig.

Botanical Name.—Fi'-cus car'-i-ca. *Natural Order:* Moraceæ. *Habitat:* Asia, cultivated.

Part Used.—Partially dried fruit.

Description.—From 2 to 3 in. (5 to 7.5 Cm.) long, usually compressed, irregularly pear-shaped, fleshy, brownish or yellowish, frequently with an efflorescence of sugar; apex with a small, scaly orifice; base with a scar or short stalk; internally hollow, with numerous small, brownish-yellow, glossy, and hard akenes; odor distinct, fruity; taste sweet, pleasant. Usually dried in the sun or in ovens. The largest and best are the Smyrna or Turkey figs, the Greek being smaller.

Active Principles.—Sugar, Seeds.

Action and Uses.—**Emollient** in gum-boils and abscesses; **demulcent** in intestinal irritation; **laxative** for constipation, the seeds acting mechanically.

Preparation and Dose.—Confection of senna, ½ to 2 ℥ (2 to 8 Gm.).

HUMULUS.

Synonyms.—Hops, Hop.

Botanical Name.—Hu'-mu-lus lu'-pu-lus. *Natural Order:* Moraceæ. *Habitat:* North Temperate zone.

Parts Used.—Strobiles, Lupulin (glandular trichomes separated from the fruit). *Adulterants:* Poor grades that have been manipulated.

Description.—Hops: Ovoid-cylindrical, about 1 in. (3 Cm.) long, consisting of a thin, hairy, flexuous rachis and numerous yellowish-green to pale-brown, obliquely ovate, membranaceous scales with a glandular-hairy base, frequently infolded on one side, enclosing a subglobular, light-brown, very glandular akene; odor strong and agreeable; taste aromatic and bitter.

LUPULIN.—A granular powder, bright brownish yellow, becoming yellowish brown, resinous; its component trichomes somewhat globular or ellipsoidal, multicellular; having the characteristic odor and taste of hops.

Hops in which the flowers have not been fertilized are stronger; great care must be used in drying. Hops deteriorate quite rapidly and should not be used after they are a year old, if fresh can be secured. Unbroken loose hops are less likely to have had the lupulin removed, though they do not keep as well as when pressed into cakes. Lupulin is separated by handling and rubbing the strobiles, then **sifting.**

Active Principles.—Volatile oil, Resin.

Action and Uses.—HOPS: *External:* In form of poultice, as an **anodyne** for boils, bruises, inflammations; probably much of the good comes from the heat and moisture. *Alimentary canal:* Bitter **tonic,** often in the form of beer, for dyspepsia; **carminative,** in flatulence and some diarrheas. *Nervous system:* **Sedative** and **hypnotic** in nervousness and delirium of drunkards, insomnia (hop pillow); **antispasmodic,** in hysteria. Diaphoretic, diuretic, aphrodisiac, cardiac stimulant. LUPULIN: Used like hops.

Preparations and Doses.—Hops, 10 to 40 gr. (0.6 to 2.6 Gm.). Lupulin, 5 to 15 gr. (0.3 to 1 Gm.). Fluidextract of lupulin, 5 to 15 ♏ (0.3 to 1 Cc.). Oleoresin of lupulin, 1 to 5 gr. (0.06 to 0.3 Gm.).

CANNABIS INDICA.

Synonyms.—Indian cannabis, Indian hemp, Hashish (a confection), Gunjah (leaves), Churrus (impure resin).

Botanical Name.—Can'-na-bis sa-ti'-va. *Natural Order:* Moraceæ. *Habitat:* East Indies, Asia.

Part Used.—Flowering tops of pistillate plants, gathered before the fruit is developed. *Adulterants:* Staminate flowers, old tops; tops from which resin has been removed.

Description.—In dark-green or more or less brownish, compressed masses, consisting of the densely paniculate branchlets, about 2 in. (5 Cm.) or more in length, and the inflores-

cence more or less agglutinated, with a resinous exudation; commonly with a few undeveloped digitate leaves of one or more linear-lanceolate leaflets; numerous sheathing, pointed bracts, each containing two small, mature, but unfertilized, pistillate flowers; odor narcotic; taste characteristic.

The drug seems to be more active when grown in warm countries. The American (Cannabis americana) is similar to the Indian, but less active. The drug is very unreliable; begins to lose strength soon after harvesting; should not be used when more than a year old; when two years old it is nearly worthless. Fertilized tops are much weaker.

Active Principles.—Not definitely determined. Probably a green resin (Cannabin), a red oil (Cannabinol), and an alkaloid (Cannabinine).

Action and Uses.—Mainly on nervous system; may produce severe symptoms, but no death has been recorded. Large doses may cause intoxication and hallucinations, the character depending upon the individual; one symptom in particular is loss of measurement of time and space. Used as a **hypnotic** in delirium tremens, traumatic tetanus; **analgesic** in migraine and neuralgia; **antispasmodic** and sedative in whooping-cough, dysuria, and muscular spasms; **emmenagogue** in dysmenorrhea, menorrhagia, and metritis; **aphrodisiac** in functional impotence.

Preparations and Doses.—Extract, $\frac{1}{4}$ to 1 gr. (0.015 to 0.06 Gm.). Fluidextract, 1 to 10 ♏ (0.06 to 0.6 Cc.), sometimes as high as 1 ℥ (4 Cc.). Tincture, 10 to 60 ♏ (0.6 to 4 Cc.).

SANTALUM ALBUM.*

Synonyms.—White sandal wood, White saunders.

Botanical Name.—San-ta′-lum al′-bum. *Natural Order:* Santalaceæ. *Habitat:* Asia, East Indies.

Part Used.—Heart-wood.

Description.—Billets, dirty light-brown color, heavy, hard, often showing the marks of the ax in removing the sap-wood. Only the heart-wood should be used.

Active Principle.—Volatile oil.

Action and Uses.—The wood itself is not used in medicine, but the oil is. The oil resembles copaiba and cubebs. **Stimulant** and **disinfectant** of the respiratory and genito-urinary mucous membranes; used for bronchitis, some forms of asthma, pyelitis, cystitis, but chiefly for gonorrhea. Used in perfumes. The wood is used in making cabinets and articles of furniture.

Dose.—Oil, 5 to 15 ♏ (0.3 to 1 Cc.).

SERPENTARIA.

Synonyms.—Serpentaria, Snakeroot. (1) Virginia snakeroot. (2) Texas snakeroot.

Botanical Names.—(1) Ar-is-to-lo′-chi-a ser-pen-ta′-ri-a. (2) A. re-tic-u-la′-ta. *Natural Order:* Aristolochiaceæ. *Habitat:* United States.

Parts Used.—Rhizome and roots. *Adulterants:* Other species, spigelia.

Description.—Virginia Serpentaria: Rhizome of oblique growth, about 1 in. (2.5 Cm.) long; externally yellowish brown, slightly annulate, the upper surface with numerous stem-scars or stem-bases, the lower surface bearing a dense tress of thin, branching roots from 1½ to 3 in. (4 to 7.5 Cm.) long; fracture short, yellowish brown; odor camphoraceous; taste bitter and aromatic.

Texas Serpentaria: The rhizome is about twice as large as that of Virginia serpentaria, of a grayish-brown color, and the roots are fewer, less interlacing, and thicker.

Active Principles.—Volatile oil, Aristolochine (alkaloid), Aristolochin (bitter principle).

Action and Uses.—Seldom used alone. Large doses cause nausea, vomiting, vertigo. Used as bitter **stomachic** with other tonics; stimulating **expectorant** in bronchitis, and pneumonia; **diaphoretic** to bring out a tardy rash; **antidote** to snake bite, but of little or no service; **emmenagogue** in anemia, chlorosis; diuretic, aphrodisiac.

Preparations and Doses.—Fluidextract, 10 to 60 ♏ (0.6 to 4 Cc.). Tincture of serpentaria and Compound tincture of cinchona, ½ to 2 ℥ (2 to 8 Cc.).

ASARUM.*

Synonyms.—Canada snakeroot, Wild ginger.

Botanical Name.—As'-a-rum can-a-den'-sis. *Natural Order:* Aristolochiaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots.

Description.—About 4 in. (10 Cm.) long, and $\frac{1}{8}$ in. (3 Mm.) thick, somewhat curved, branched, few roots, brownish and wrinkled externally, lighter internally, hard, brittle; aromatic odor; bitter, pungent taste.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Similar to serpentaria, but weaker.

Dose.—15 to 30 gr. (1 to 2 Gm.).

RHEUM.

Synonym.—Rhubarb.

Botanical Names.—Rhe'-um of-fi-ci-na'-le, R. pal-ma'-tum and the variety tan-gut'-i-cum, or other species. *Natural Order:* Polygonaceæ. *Habitat:* Asia.

Part Used.—Rhizome. *Adulterants:* European or common rhubarb, curcuma, low-grade drug.

Description.—Subcylindrical, barrel-shaped, conical plano-convex or irregularly formed pieces, frequently with a large perforation; hard and moderately heavy; 2 to 6 in. (5 to 15 Cm.) long, $1\frac{1}{2}$ to 3 in. (4 to 8 Cm.) in diameter; externally mottled with alternating striæ of light-brown parenchyma cells and dark-brown, medullary rays, occasionally with reddish-brown cork patches and small, radiate scars of fibrovascular tissue; smooth and sometimes covered with a bright brownish-yellow powder; fracture somewhat granular, presenting a peculiar marbled appearance; odor characteristic; taste bitter, astringent, gritty when chewed.

The plant resembles the common pie plant (Rheum rhaponticum). Rhizome is dug in the fall, bark removed, dried by artificial heat or by stringing and hanging in the shade, the larger pieces being sliced; the method of drying

causing some variation in appearance. Insects are very liable to attack it. Russian rhubarb got its name because it was exported through Russia.

Active Principles.—Chrysophanic acid, Emodin, Tannic acid.

Action and Uses.—Alimentary canal: Small doses increase saliva, gastric juice, peristalsis, and absorption; used as a **tonic** and **astringent** in dyspepsia and some forms of diarrhea. In large doses the **purgative** action prevails; stools are soft, colored yellow brown. It causes griping and evacuation in 4 to 8 hours; bile is increased; coloring matter is eliminated by feces, urine, sweat, milk. On account of the tannic acid it causes subsequent constipation, consequently is not good as an habitual laxative. Used for diarrhea due to indigestion or the presence of irritating foreign matter.

Preparations and Doses.—Extract, 1 to 10 gr. (0.06 to 0.6 Gm.). Fluidextract, 10 to 30 ♏ (0.6 to 2 Cc.). Tincture, Aromatic tincture, Syrup, Aromatic syrup, Mixture of rhubarb and soda, ½ to 4 ℥ (2 to 15 Cc.). Compound rhubarb powder, 15 to 60 gr. (1 to 4 Gm.). Pills.

RUMEX.*

Synonyms.—Yellow, Curled, or Narrow-leaved dock.

Botanical Name.—Ru′-mex cris′-pus and other species. *Natural Order:* Polygonaceæ. *Habitat:* Europe, Asia, North America.

Part Used.—Root.

Description.—From 8 to 12 in. (20 to 30 Cm.) long, and ⅖ to ⅗ in. (10 to 15 Mm.) thick, somewhat fusiform, fleshy, nearly simple, annulate above, deeply wrinkled below, few rootlets, rusty brown outside, lighter inside, rather thick bark, fracture short; peculiar odor; bitter astringent taste.

Active Principles.—Rumicin, Emodin.

Action and Uses.—Similar to Rhubarb, but not used much. Has been used as an **alterative** in syphilis and skin diseases.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

BISTORTA.*

Synonym.—Bistort.

Botanical Name.—Po-lyg′-o-num bis-tor′-ta. *Natural Order:* Polygonaceæ. *Habitat:* Europe, Asia, North America.

Part Used.—Rhizome.

Description.—S-shaped, thick, flattened, about 2 in. (5 Cm.) long, root scars on under side, red brown; odorless; astringent taste.

Active Principle.—Tannin.

Action and Uses.—Similar to geranium.

CHENOPODIUM.*

Synonyms.—American wormseed, Jesuit tea, Jerusalem oak.

Botanical Name.—Chen-o-po′-di-um an-thel-min′-ti-cum. *Natural Order:* Chenopodiaceæ. *Habitat:* Tropical America, widely naturalized.

Part Used.—Fruit.

Description.—Nearly $\frac{1}{15}$ in. (2 Mm.) in diameter, depressed, globular, brownish to greenish color, containing a lenticular, black, glossy seed; somewhat terebinthinate odor; pungent, bitter taste.

Active Principle.—Volatile oil.

Action and Uses.—**Anthelmintic** against round-worms; should be given three times a day for 2 to 4 days, followed by a cathartic. Like other volatile oils it is a diffusible stimulant and carminative.

Preparation and Dose.—Oil, 2 to 10 ♏ (0.13 to 0.65 Cc.).

PHYTOLACCA.

Synonyms.—Poke root, Garget, Scoke, Red-ink plant.

Botanical Name.—Phy-to-lac′-ca de-can′-dra. *Natural Order:* Phytolaccaceæ. *Habitat:* North America.

Part Used.—Root. *Adulterants:* Inula, rumex.

Description.—Cylindrical, somewhat tapering, sparingly branched, 1 to 3 in. (2.5 to 7 Cm.) thick, mostly in transverse or longitudinal slices; externally yellowish brown, finely longitudinally or spirally wrinkled and thickly annulate with lighter colored, low ridges; fracture fibrous, characterized by alternating layers of fibrovascular tissue and parenchyma, the layers of the latter being much retracted; odor slight; taste sweetish, afterwards highly acrid. The fruit occurs in agglutinated masses, purplish-black color; odorless; sweetish-acrid taste.

Active Principles.—Bitter glucoside resembling saponin, Phytolaccine.

Action and Uses.—Chiefly as an **alterative** in syphilis, scrofula, rheumatism, skin diseases. **Emetic,** but causes considerable depression and should not be used as such. Laxative, cathartic, narcotic in large doses. It has caused several deaths. A preparation from the berries is used to reduce obesity. The juice from the berries is used for coloring.

Preparations and Doses.—Fluidextract, as alterative 1 to 4 ♏ (0.06 to 0.25 Cc.); as emetic 10 to 30 ♏ (0.6 to 2 Cc.).

ILLICIUM.*

Synonym.—Star-anise.

Botanical Name.—Il-lic'-i-um ve'-rum. *Natural Order:* Magnoliaceæ. *Habitat:* Asia.

Part Used.—Fruit. *Adulterant:* Fruit of the poisonous I. religiosum.

Description.—Pedunculate, consists of eight boat-shaped carpels arranged in form of a star; carpels are about $\frac{1}{3}$ in. (8 Mm.) long, wrinkled, red brown, each containing one flattened-oval, glossy seed of brown color; odor of anise; taste sweet and anise-like.

Active Principle.—Volatile oil.

Action and Uses.—Similar to anise.

Doses.—5 to 30 gr. (0.3 to 2 Gm.). Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.).

WINTERA.*

Synonyms.—Winter's bark, Winter's cinnamon.

Botanical Name.—Dri'-mys win'-te-ri. *Natural Order:* Magnoliaceæ. *Habitat:* South America.

Part Used.—Bark.

Description.—Quills, bark $\frac{1}{8}$ to $\frac{1}{2}$ in. (3 to 12 Mm.) thick, dark brown, outside sometimes nearly covered by whitish lichen, inside covered with ridges and grooves; odor suggestive of canella and cinnamon; taste aromatic and bitter.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Resembles cascarilla.

Dose.—15 to 30 gr. (1 to 2 Gm.).

MYRISTICA.

Synonym.—Nutmeg.

Botanical Name.—My-ris'-ti-ca fra'-grans. *Natural Order:* Myristicaceæ. *Habitat:* Molucca Islands.

Part Used.—Kernal of ripe seed. *Adulterant:* Exhausted nutmeg.

Description.—Ovoid or ellipsoidal, about 1 in. (25 Mm.) long; externally light brown, reticulately furrowed, with a circular scar at the broad end; internally more or less mottled from the infolding of the light-brown perisperm and tegmen with the yellowish-brown endosperm; easily cut, the cut surface having a waxy lustre; odor strongly aromatic; taste agreeably aromatic, warm, and slightly bitter.

Macis: (1890 U. S. P.). Mace is the arillus from the nutmeg. Flat, narrow bands, about 1 in. (2.5 Cm.) long, $\frac{1}{12}$ in. (2 Mm.) thick at base, thinner above, branched and lobed, brownish orange; odor and taste of nutmeg.

The fruit, resembling a peach, is split open and the one seed almost completely covered with the arillus is removed; the seed is slowly dried at about 60° C. The kernel shrinks and rattles in the testa; shell is then broken and the kernel used in that condition or limed to cover defects and prevent

the ravages of insects. Artificial nutmegs have been reported. The nutmeg butter of commerce is the fixed oil containing a little volatile oil.

Active Principles.—Volatile oil, Fixed oil.

Action and Uses.—Similar to other drugs containing volatile oils, except that it has some narcotic properties; chiefly as a **condiment**. Has been used to produce abortion, but often with fatal results. Mace is similar to nutmeg.

Dose.—5 to 20 gr. (0.3 to 1.3 Gm.).

BOLDUS.*

Synonyms.—Boldo, Boldu.

Botanical Name.—Peu'-mus bol'-dus. *Natural Order:* Monimiaceæ. *Habitat:* South America.

Part Used.—Leaves.

Description.—About 2 in. (5 Cm.) long, and $\frac{2}{3}$ as broad, nearly elliptical, entire edges recurved, thick, green to brown, hairy beneath with prominent veins; terebinthinate odor; disagreeable, aromatic taste.

Active Principles.—Boldine, Volatile oil.

Action and Uses.—Tonic and cholagogue for dyspepsia, rheumatism, anemia, liver troubles; sedative and **hypnotic** in mania and excitement.

Preparations and Doses.—Fluidextract, 1 to 5 ♏ (0.06 to 0.3 Cc.). Boldine, 1 to 3 gr. (0.06 to 0.18 Gm.).

HYDRASTIS.

Synonyms.—Golden seal, Yellow puccoon, Indian dye, Jaundice root.

Botanical Name.—Hy-dras'-tis can-a-den'-sis. *Natural Order:* Ranunculaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots. *Adulterants:* Serpentaria, cypripedium.

Description.—Rhizome of oblique growth, subcylindrical, straight or somewhat tortuous, 1 to 2 in. (2 to 5 Cm.) long,

with short stem remnants, or stem scars, and slightly annulate; externally brownish gray to yellowish brown; fracture short, waxy, deep yellow; wood wedges bright yellow, pith large, light yellow; the roots thin, brittle, with a thick, yellow bark; odor distinct; taste bitter. The wild plant is becoming scarce and it is now being cultivated. The powder is deep yellow.

Active Principles.—Hydrastine, Berberine, Canadine.

Action and Uses.—External: **Styptic, antiseptic, stimulant,** and **alterative** when applied to mucous membranes; used for all forms of catarrhal troubles, unhealthy sores, stomatitis, tonsillitis, fissured nipples, conjunctivitis, syphilitic sores, hemorrhoids, fistulas, gonorrhea, leucorrhea, vaginitis; value due largely to hydrastine. *Alimentary canal:* Increases appetite, gastro-intestinal secretions, bile, peristalsis, due to the berberine; used as a bitter **tonic** in chronic dyspepsia, gastro-intestinal catrrah; **cholagogue** in hepatic constipation and jaundice. *Circulation:* Slows and strengthens the heart, increases the blood pressure; **cardiac tonic; antiperiodic** in malaria and intermittent fever; next to cinchona, but far inferior. *Respiration:* Quickened; toxic doses paralyze. *Uterus:* Produces contractions of pregnant or non-pregnant uterus; **emmenagogue** in metrorrhagia, dysmenorrhea, metritis; hydrastinine particularly acts on this organ. **Diuretic, antispasmodic** in hydrophobia and strychnine poisoning.

Preparations and Doses.—Fluidextract and Glycerite, 10 to 45 ♏ (0.6 to 3 Cc.). Tincture, 30 to 90 ♏ (2 to 6 Cc.). Hydrastine, $\frac{1}{8}$ to $\frac{1}{2}$ gr. (0.008 to 0.032 Gm.). Hydrastinine hydrochloride, $\frac{1}{4}$ to 1 gr. (0.016 to 0.065 Gm.).

HELLEBORUS.*

Synonyms.—Black hellebore, Christmas rose.

Botanical Name.—Hel-leb′-o-rus ni′-ger. *Natural Order:* Ranunculaceæ. *Habitat:* Europe.

Parts Used.—Rhizome and Roots.

Description.—About 2 in. (5 Cm.) long, and $\frac{1}{2}$ in. (12 Mm.) thick, knotty, short branches, crooked, thick bark, blackish

with whitish pith, numerous roots; odorless; sweetish, then bitter, acrid taste.

Active Principles.—Helleborin, Helleborein.

Action and Uses.—Not much used now. Has been used as drastic **purgative** in dropsies; **emmenagogue** in amenorrhea; used in cutaneous diseases and in mania; helleborein has been used as a substitute for digitalis.

Preparations and Doses.—Fluidextract, 2 to 15 ♏ (0.13 to 1 Cc.). Helleborein, $\frac{1}{16}$ to $\frac{1}{10}$ gr. (0.004 to 0.006 Gm.).

ADONIS.*

Synonyms.—False hellebore, Pheasant's eye.

Botanical Name.—A-do'-nis ver-na'-lis. *Natural Order:* Ranunculaceæ. *Habitat:* Europe, Asia.

Part Used.—Herb.

Description.—Branching stem, 4 to 10 in. (10 to 25 Cm.) long, leaves many cleft and sessile, light green, bitter.

Active Principle.—Adonidin.

Action and Use.—Resembles **digitalis** in many ways, but is more irritating, acts more quickly, not cumulative, less beneficial in valvular diseases.

Preparations and Doses.—Infusion, representing 2 to 10 gr. (0.13 to 0.65 Gm.). Adonidin, $\frac{1}{16}$ to $\frac{1}{3}$ gr. (0.004 to 0.02 Gm.).

COPTIS.*

Synonyms.—Gold thread, Canker root.

Botanical Name.—Cop'-tis tri-fo'-li-a. *Natural Order:* Ranunculaceæ. *Habitat:* North America.

Part Used.—Rhizome.

Description.—Long masses, golden-yellow, thread-like, sometimes mixed with a few trifoliate leaves and stems; odorless, bitter; no other drug like it.

Active Principles.—Berberine, Coptine.

Action and Uses.—Simple bitter **tonic**, resembling calumba; also used as mouth-wash for canker sores and gargle for sore throat.

Dose.—15 to 60 gr. (1 to 4 Gm.) in form of infusion.

XANTHORRHIZA.*

Synonym.—Yellow Root.

Botanical Name.—Xan-thor-rhi′-za a-pi-i-fo′-li-a. *Natural Order:* Ranunculaceæ. *Habitat:* United States.

Parts Used.—Rhizome and roots.

Description.—Slender, 2 to 3 in. (5 to 7.5 Cm.) long, crooked, much branched, wrinkled longitudinally, hard, woody centre, yellow brown; roots few; nearly odorless; bitter, astringent taste.

Active Principle.—Berberine.

Action and Uses.—Bitter tonic, resembling calumba.

Dose.—15 to 60 gr. (1 to 4 Gm.).

CIMICIFUGA.

Synonyms.—Black snakeroot, Black cohosh, Bugbane.

Botanical Name.—Cim-i-cif′-u-ga ra-ce-mo′-sa. *Natural Order:* Ranunculaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots.

Description.—From 1 to 4 in. (2.5 to 10 Cm.) long, ½ to 1 in. (12 to 25 Mm.) thick, numerous erect branches terminating in cup-shaped cavities, hard, fracture short, pith large; bark thin, blackish externally, lighter internally; coarse, wiry roots; slight odor; bitter, acrid taste.

Active Principles.—Cimicifugin, Resins.

Action and Uses.—Used empyrically. Bitter **tonic** in irritable dyspepsia; slows the heart and lowers blood pressure, **cardiac tonic**; resembling digitalis, but feebler and safer; nerve tonic in chorea, delirium tremens; **expectorant** for bronchitis; ecbolic; **emmenagogue** in amenorrhea, dysmenorrhea, ovarian neuralgia; diuretic.

Preparations and Doses.—Extract, 1 to 6 gr. (0.06 to 0.36 Gm.). Fluidextract, 5 to 30 ♏ (0.3 to 2 Cc.). Tincture, ½ to 2 ℥ (2 to 8 Cc.). Macrotin,* ½ to 2 gr. (0.03 to 0.13 Gm.).

STAPHISAGRIA.

Synonym.—Stavesacre.

Botanical Name.—Del-phin'-i-um staph-i-sa'-gri-a. *Natural Order:* Ranunculaceæ. *Habitat:* Mediterranean Basin.

Part Used.—Seed.

Description.—Irregularly tetrahedral, one side convex, ⅕ to ¼ in. (5 to 6 Mm.) long, and ⅛ to ¼ in. (3 to 6 Mm.) broad; externally blackish brown, becoming lighter with age, strongly reticulate; endosperm oily, enclosing a small, straight embryo; odor slight; taste intensely bitter and acrid.

Active Principles.—Delphinine, Delphisine, Delphinoidine, Staphisagrine.

Action and Uses.—Chiefly externally as a **parasiticide** against pediculi and scabies; delphinine has been used as **counterirritant** for neuralgia and rheumatism, but must not be applied to the broken skin. Internally it is a severe gastro-intestinal irritant, cardiac and respiratory depressant. Delphinine resembles aconitine and veratrine.

Preparations and Doses.—Fluidextract, ½ to 2 ♏ (0.032 to 0.13 Gm.). Delphinine,* 1/12 to ¼ gr. (0.005 to 0.015 Gm.).

DELPHINIUM.*

Synonym.—Larkspur.

Botanical Name.—Del-phin'-i-um con-sol'-i-da. *Natural Order:* Ranunculaceæ. *Habitat:* Europe, North America.

Part Used.—Seed.

Description.—Flattened tetrahedrals, sharp edges; much like staphisagria, but smaller, smoother, and black; odorless; bitter, acrid taste.

Active Principles, Action, and Uses.—Similar to staves-acre.

ACONITUM.

Synonyms.—Aconite, Monkshood, Wolfsbane, Friar's cap, Mousebane.

Botanical Name.—Ac-o-ni'-tum na-pel'-lus. *Natural Order:* Ranunculaceæ. *Habitat:* Europe, cultivated.

Part Used.—Tuberous roots. *Adulterants:* Other species, old hollow tubers.

Description.—Slenderly conical, $1\frac{1}{2}$ to 4 in. (4 to 10 Cm.) long, $\frac{2}{5}$ to $\frac{4}{5}$ in. (10 to 20 Mm.) thick at the crown; occasionally split; longitudinally wrinkled; dark brown and marked with coarse, whitish root-scars; fracture short, horny or mealy; internally whitish or light brown; the cambium zone irregular and 5- to 7-angled; odor very slight; taste sweetish, soon becoming acrid and developing a tingling sensation, followed by numbness.

The cultivated is more active than the wild. Sometimes grown in gardens for the flowers. The Br. P. requires collection in the fall, but if the wild is collected at the time of flowering there is less danger of getting other species. Leaves are strongest at the time of flowering, but are much weaker than the tuber and vary in strength. This is one of the most poisonous of vegetable drugs. Napellus means "little turnip," referring to the shape of the tuber.

Active Principles.—Aconitine (U. S. P. requires the tuber to contain 0.5 per cent.), Picraconitine, Pseudaconitine, Aconine; others have been reported.

Action and Uses.—External: Stimulates, then paralyzes the terminations of sensory nerves, producing itching, tingling, burning, followed by numbness and loss of sensation; inhaled it causes sneezing and increased secretion. **Sedative** for neuralgias, toothache, pruritus, chilblains, sciatica, rheumatism; generally used in the form of a liniment. *Internal:* Main action is that of a depressant. *Alimentary canal:* Numbing, pricking sensation; increases secretions; said to be anti-emetic in vomiting of pregnancy. *Nervous system:* Decreases activity of peripheral terminations of nerves of sensation and later of motion; reflex action is decreased. Used as

antispasmodic in asthma and spasmodic croup. *Circulation:* Heart is first slowed by action on the heart muscle and by stimulation of the vagus; blood pressure falls. Large doses later cause the heart to be rapid and irregular; peripheral vessels are dilated. Used as a **sedative** in palpitation of the heart and in aneurysms. *Respiration:* Slowed by effect on nerve centre in medulla, death generally resulting from paralysis of respiration. *Skin:* **Diaphoretic** on account of dilatation of cutaneous vessels. *Kidneys:* **Diuretic** in case of fevers. *Uterus:* **Emmenagogue** in case of suppression of menstruation due to cold. *Temperature:* Reduced, probably partly due to reduced heat production, reduced circulation, and increased heat radiation. **Antipyretic** for acute fevers, particularly when due to local inflammation as in coryza, pharyngitis, tonsillitis, bronchitis, pleurisy, acute pneumonia, irritative fevers. The best preparation is the tincture given frequently in small doses. It should not be given in weakened condition of the heart or in long-continued fevers. Aconitine varies greatly in strength.

Toxicology.—Symptoms: A very large dose may cause death by paralysis of the heart. Smaller fatal doses produce in a few minutes a burning, tingling, numbing sensation in the mouth, stomach, and finger-tips, formication, increased saliva, occasionally vomiting, pale face; cold, clammy skin; slow, then rapid, irregular pulse; weak, irregular respiration; dilated or contracted pupils, restlessness, distress, fatigue, sometimes convulsions; death from asphyxia; consciousness generally retained until asphyxiated. *Treatment:* Keep patient lying down; sitting up may cause heart-failure; wash out stomach; give emetics, as apomorphine (other emetics often fail); tannic acid to precipitate the alkaloids; ether, alcohol, and digitalis (in the order named) by hypodermic injection; ammonia, strychnine, amyl nitrite, atropine; heat to the body; artificial respiration.

Preparations and Doses.—Fluidextract, $\frac{1}{2}$ to 2 ♏ (0.03 to 0.13 Cc.). Tincture, 1 to 15 ♏ (0.065 to 1 Cc.). Aconitine, $\frac{1}{600}$ to $\frac{1}{200}$ gr. (0.0001 to 0.0003 Gm.).

PULSATILLA.*

Synonyms.—Pasque flower, Meadow anemone, Easter flower.

Botanical Names.—A-nem′-o-ne pul-sa-til′-la and A. pra-ten′-sis. *Natural Order:* Ranunculaceæ. *Habitat:* Europe, Asia, North America.

Part Used.—Herb.

Description.—Long-petioled, radical leaves, twice or thrice deeply parted, with linear, acute lobes; odorless; acrid taste; collected soon after flowering. Should not be kept longer than a year, on account of volatilization of anemonin.

Active Principles.—Anemonin, Acrid camphor.

Action and Uses.—Many claims have been made for this drug, and it has been recommended in a large number of diseases. Some physicians praise it highly and others find no value in it. The juice seems to be much more active than the dried drug and this possibly accounts for the variation in results. It is an **irritant** both externally and in alimentary canal. Used in cataracts and other eye troubles; in paralysis, rheumatism, melancholia, catarrhal conditions of mucous membranes, skin diseases, syphilis; said to have a specific effect on generative organs; used in epididymitis, orchitis, ovaritis, dysmenorrhea.

Dose.—2 to 5 gr. (0.13 to 0.32). Probably a tincture of the fresh plant is the best preparation.

HEPATICA.*

Synonyms.—Liverleaf, Golden trefoil.

Botanical Name.—He-pat′-i-ca he-pat′-i-ca. *Natural Order:* Ranunculaceæ. *Habitat:* North America.

Part Used.—Leaves.

Description.—Cordate, deeply lobed, about 2 in. (5 Cm.) long, green, smooth, hairy petioles; odorless; mucilaginous taste.

Active Principles.—Mucilage, Tannin.

Action and Uses.—Tonic, demulcent, mild astringent.
Dose.—15 to 60 gr. (1 to 4 Gm.).

BERBERIS.

Synonyms.—Oregon grape, Barberry, California barberry.
Botanical Name.—Ber′-ber-is a-qui-fo′-li-um and other species. *Natural Order:* Berberidaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots. *Adulterant:* Stems.

Description.—In more or less knotty, irregular pieces of varying length and from $\frac{1}{8}$ to $\frac{4}{5}$ in. (3 to 20 Mm.) in diameter; wood yellowish, distinctly radiate, with narrow, medullary rays; hard and tough; rhizome with a small pith; odor distinct; taste strongly bitter. Pieces without the bark should be rejected.

Active Principles.—Berberine, Oxycanthine.

Action and Uses.—Bitter **tonic** in dyspepsia; **astringent** in diarrhea; **alterative** in skin and syphilitic diseases; cathartic in large doses; antiseptic, antiperiodic.

Preparation and Dose.—Fluidextract, 10 to 30 ♏ (0.6 to 2 Cc.).

BERBERIS VULGARIS.*

Synonyms.—Barberry, Sour-berry, Jaundice-berry.
Botanical Name.—Ber′-ber-is vul-ga′-ris. *Natural Order:* Berberidaceæ. *Habitat:* Europe, Asia.

Part Used.—Bark of root.

Description.—Long, thin pieces, easily separated into layers, yellow gray externally, bright yellow internally; odorless; bitter taste.

Active Principles, Action, and Uses.—Similar to Oregon grape.

PODOPHYLLUM.

Synonyms.—Mandrake, May apple, Vegetable mercury, Ground or Wild lemon, Hog apple.

Botanical Name.—Pod-o-phyl'-lum pel-ta'-tum. *Natural Order:* Berberidaceæ. *Habitat:* North America.

Part Used.—Rhizome.

Description.—Of horizontal growth and variable length, subcylindrical, flattened above, sometimes branched, consisting of joints, 2 to 4 in. (5 to 10 Cm.) long; externally pale yellowish brown to dark brown, nearly smooth; nodes annulate, the upper surface being marked by large, cup-shaped scars, the lower surface with numerous root-scars or remains of roots; fracture short; the fractured surface mealy or horny, whitish to pale brown, with a circle of small wood bundles, and a large pith; odor slight, more pronounced and characteristic in the powder; taste sweetish and disagreeably bitter and acrid.

Active Principle.—Resin, commonly called podophyllin and containing podophyllotoxin and picropodophyllin.

Action and Uses.—The powder, particularly the resin, getting into the eyes or nose produces intense irritation. It increases intestinal secretions and in small doses the secretion of bile, and in large doses the elimination of bile; causes griping, and may cause nausea. Requires ten to twenty-four hours to act, acting mainly on the duodenum, producing a watery stool. **Hydragogue,** direct and indirect **cholagogue,** used in hepatic constipation, so-called biliousness where calomel is objectionable, jaundice, ascites, hemorrhoids, diarrhea, bilious vomiting, headache. May be combined with belladonna, nux vomica, or henbane.

Preparations and Doses.—Fluidextract, 1 to 20 ♏ (0.06 to 1.3 Cc.). Resin, laxative $\frac{1}{20}$ to $\frac{1}{10}$ gr. (0.0032 to 0.0065 Gm.); purgative $\frac{1}{10}$ to $\frac{1}{2}$ gr. (0.0065 to 0.032 Gm.).

CAULOPHYLLUM.*

Synonyms.—Blue cohosh, Squaw-root, Pappoose-root.

Botanical Name.—Caul-o-phyl′-lum thal-ic-troi′-des. *Natural Order:* Berberidaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots. *Adulterant:* Jeffersonia.

Description.—About 4 in. (10 Cm.) long, $\frac{1}{5}$ to $\frac{2}{5}$ in. (5 to 10 Mm.) thick, crooked; on upper side broad, concave scars from stems; short, knotty branches; gray brown outside, whitish inside, tough and woody; roots numerous and matted so to nearly cover rhizome; nearly odorless; sweetish, then bitter, acrid taste.

Active Principles.—Leontin, Caulophylline.

Action and Uses.—Used by the aborigines for all kinds of female diseases. Said to prevent abortion and also to increase uterine contractions in labor. **Antispasmodic** in hysteria, spasmodic after pains; **emmenagogue**, oxytocic, diuretic, sternutatory.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

PAREIRA.

Synonym.—Pareira brava.

Botanical Name.—Chon-dro-den′-dron to-men-to′-sum. *Natural Order:* Menispermaceæ. *Habitat:* South America.

Part Used.—Root. *Adulterants:* Cissampelos; False, White, and Yellow pareira.

Description.—Subcylindrical, knotty, and somewhat tortuous; cut into pieces of various lengths, $\frac{2}{5}$ to $2\frac{1}{2}$ in. (1 to 6 Cm.) in diameter; externally blackish brown, with transverse ridges and fissures and longitudinal furrows; hard, heavy, and tough; when freshly cut it has a waxy lustre, internally yellowish or brownish gray, the dried transverse sections exhibiting several inequilaterally concentric circles of interrupted, porous wood wedges projecting beyond the markedly retracted intervening tissue of the rather large, medullary rays; odor slight; taste bitter.

Active Principle.—Pelosine.

Action and Uses.—**Diuretic,** similar to buchu. Stimulating effect on mucous membrane; used in pyelitis, cystitis, urethritis.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

MENISPERMUM.*

Synonyms.—Canadian moonseed, Yellow parilla, Texas or Yellow sarsaparilla.

Botanical Name.—Men-is-per'-mum can-a-den'-se. *Natural Order:* Menispermaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots.

Description.—Several feet long, about $\frac{1}{5}$ in. (5 Mm.) thick, but few branches, somewhat jointed; fine, longitudinal wrinkles; fine, thin, brittle roots at the nodes; fracture tough and woody; yellowish to grayish brown externally, yellowish internally; irregular pith; bark rather thin; odorless; bitter taste.

Active Principles.—Berberine, Menispine.

Action and Uses.—Quite similar to calumba. Not much used.

Dose.—15 to 60 gr. (1 to 4 Gm.).

CALUMBA.

Synonym.—Columbo.

Botanical Name.—Jat-e-o-rhi'-za pal-ma'-ta. *Natural Order:* Menispermaceæ. *Habitat:* Africa.

Part Used.—Root. *Adulterants:* Bryonia and American columbo dyed and made bitter with quassia or other bitters.

Description.—In transverse, circular or oval, biconcave sections, 1 to 2 in. (2.5 to 5 Cm.) in diameter and $\frac{1}{12}$ to $\frac{1}{2}$ in. (2 to 12 Mm.) thick; externally greenish brown and roughly wrinkled; internally yellowish or grayish yellow, with a few interrupted circles of fibrovascular bundles, distinctly radiate in the outer portion, with a dark cambium; fracture short, mealy; odor slight; taste slightly aromatic, very bitter.

Active Principles.—Berberine, Calumbin, no tannin.

Action and Uses.—A typical **bitter tonic,** but one of the mildest; irritates terminations of nerves of taste; increases appetite, saliva, gastric juice, gastric movement, absorption, vascular dilatation; somewhat antiseptic; both red and white blood corpuscles are increased. Used in atonic dyspepsia, anemia, convalescence, vomiting of pregnancy, seasickness, diarrhea due to relaxed condition, cholera morbus, flatulence. It should not be too concentrated or given over too long a time; it should not be given in acute inflammation of stomach or in acute fevers. Containing no tannin it can be given with iron. An infusion is used as **anthelmintic** against thread-worms, given by enema.

Preparations and Doses.—Fluidextract, 5 to 45 ♏ (0.3 to 3 Cc.). Tincture, ½ to 2 ℥ (2 to 8 Cc.).

COCCULUS.*

Synonyms.—Cocculus indicus, Fishberry.

Botanical Name.—An-i-mir′-ta pa-nic-u-la′-ta. *Natural Order:* Menispermaceæ. *Habitat:* East Indies.

Part Used.—Fruit.

Description.—Kidney-shaped, about ¼ in. (6 Mm.) in diameter, an obscure ridge around the convex edge, shell thin, externally wrinkled and blackish brown; internally whitish; odorless; pericarp nearly tasteless, but the shrivelled embryo very bitter.

Active Principles.—Picrotoxin, Menispermine.

Action and Uses.—External: A decoction of the berries or an ointment of picrotoxin is used as a **parasiticide** for itch, lice, and ringworm. *Internal:* Picrotoxin is used in nervous diseases, epilepsy, chorea, paralysis, eclampsia; also used in dyspepsia, and flatulence. *Toxicology:* Acrid narcotic poison; produces salivation, vomiting, slow pulse, quickened respiration, stupor, coma, death usually by asphyxia; treatment is similar to that of strychnine poisoning. Fishberries are sometimes used to stupefy fish so that they can be caught.

Dose.—Picrotoxin, $\frac{1}{64}$ to $\frac{1}{20}$ gr. (0.001 to 0.003 Gm.).

SASSAFRAS.

SASSAFRAS MEDULLA.

Synonyms.—Sassafras, Ague tree, Cinnamon wood.

Botanical Name.—Sas′-sa-fras va-ri-i-fo′-li-um. *Natural Order:* Lauraceæ. *Habitat:* North America.

Parts Used.—Bark of root, Pith.

Description.—BARK: In irregular, transversely curved, reddish-brown pieces of variable length; outer surface nearly smooth; inner surface obscurely short-striate; soft, fragile, with a short, corky fracture; strongly fragrant; taste mucilaginous, aromatic, and astringent.

PITH: In more or less cylindrical, often curved or coiled pieces of variable length and about $\frac{1}{5}$ in. (5 Mm.) in diameter, whitish, very light; with a slight odor and a mucilaginous taste.

Active Principles.—Of bark, Volatile oil. Of pith, Mucilage.

Action and Uses.—BARK: Aromatic stimulant, astringent, flavoring. Infusion used as a popular domestic remedy as a **blood purifier,** diuretic, diaphoretic. PITH: **Demulcent** in throat troubles, gastritis, dysentery, poisoning by irritants; collyrium in conjunctivitis.

Preparations and Doses.—Infusion of bark* ad libitum. Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.).

1. CINNAMOMUM SAIGONICUM. 2. CINNAMOMUM ZEYLANICUM. 3. CINNAMOMUM CASSIA.*

Synonyms.—(1) Saigon cinnamon. (2) Ceylon cinnamon. (3) Cassia cinnamon.

Botanical Names.—(1) Cin-na-mo′-mum (species unnamed). (2) C. zey-lan′-i-cum. (3) C. cas′-si-a. *Natural Order:* Lauraceæ. *Habitat:* Asia, East Indies.

Part Used.—Bark. *Adulterants:* Of Ceylon, difficult to substitute in whole state. Of Saigon, substituted by cassia and other species. Of Cassia, other species. Of powder,

poor species, chips, buds, walnut shells, many other substances.

Description.—SAIGON: In quills about 6 in. (15 Cm.) long, and $\frac{2}{5}$ to $\frac{3}{5}$ in. (10 to 15 Mm.) in diameter, the bark $\frac{1}{12}$ to $\frac{1}{8}$ (2 or 3 Mm.) thick; outer surface gray or light grayish brown with whitish patches, more or less rough from numerous warts and some transverse ridges and fine, longitudinal wrinkles; the inner surface cinnamon brown or dark brown, granular and slightly striate; fracture short, granular, in the outer layer cinnamon colored, having near the cork numerous whitish striæ forming an almost uninterrupted line; odor agreeably aromatic; taste sweet, warmly aromatic, somewhat astringent. The whole bark from the wild tree is used, it being sweet and aromatic to the cork.

CEYLON: Long, closely rolled quills, composed of eight or more thin layers of bark; pale yellowish brown; outer surface smooth, marked with wavy lines of bast-bundles; inner surface striate; fracture short, splintery; odor agreeably aromatic; taste sweet and warmly aromatic. Bark is taken from straight, slender trees and branches, cut into quills about a foot in length, placed with the inner surface down; the outer bark is scraped off to get rid of the bitter, astringent part; several of these strips are rolled together. This has a finer flavor than the others.

CASSIA: Quills or nearly flat pieces of varying length and width, externally roughened or warty, grayish patches, nearly deprived of corky bark, internally nearly smooth.

Active Principle.—Volatile oil.

Action and Uses.—**Counterirritant** in form of a spice plaster. Similar to other plants containing oil; **carminative**, intestinal stimulant; the bark is astringent. Used for nausea, vomiting, flatulent colic, acute dysentery, to relieve griping, as antiseptic in typhoid fever, as specific in uterine hemorrhage. Cinnamic acid has been used to relieve the cough of phthisis.

Preparations and Doses.—Tincture, 15 to 60 ♏ (1 to 4 Cc.). Oil and Cinnamic aldehyde, 1 to 5 ♏ (0.06 to 0.3 Cc.). Aromatic powder, 15 to 30 gr. (1 to 2 Gm.). Aromatic fluidextract, 15 to 30 ♏ (1 to 2 Cc.).

CAMPHORA.

Synonym.—Camphor.

Botanical Name.—Cin-na-mo'-mum cam-pho'-ra. *Natural Order:* Lauraceraceæ. *Habitat:* Formosa (chiefly), Japan, China.

Part Used.—Ketone obtained from the wood.

Description.—White, translucent masses, tough, crystalline, difficult to powder except in the presence of some liquid, as alcohol, ether, or chloroform; when thrown on pure water, it has a peculiar rotary motion which is stopped by a trace of oil; volatile at ordinary temperature, sublimes on heating; penetrating, characteristic odor; pungent taste.

The consumption in the United States is estimated at 2,000,000 pounds a year. Obtained by taking roots and about 8 feet of the trunk of trees above fifty years old, cutting into chips and distilling with steam. The crude product is purified and pressed into cakes by the Japanese government, which has a complete monopoly of the industry. Much effort has been made to produce artificial camphor on a commercial basis, but so far with but little success. Oil of camphor is a bi-product of some value.

Action and Uses.—External: Causes redness, itching, dilatation of vessels and local anesthesia; has some antiseptic effect. Very often used as a mild **irritant** and **counterirritant** in rheumatism, myalgia, sciatica, lumbago, neuralgia, and chronic inflammations. The liquid formed with hydrated chloral, thymol, menthol, or phenol, is used as **antiseptic** and **anesthetic** for toothache, catarrh, pharyngitis; spirit of camphor is a domestic remedy for coryza and headache. *Alimentary canal:* Slightly increases secretions and peristalsis; **carminative** and **stomachic,** used in flatulence, summer diarrhea, hysterical vomiting, a common ingredient in cholera mixtures. *Nervous system:* Stimulates, then paralyzes; **antispasmodic** in whooping-cough, epilepsy, nervousness, delirium tremens, hiccough. *Circulation:* Heart slowed, but force increased; **cardiac stimulant** in typhoid fever and eruptive fevers. *Respiratory tract:* Respiration a little slower and deeper; tends to

allay cough and increase secretion; **expectorant** in chronic bronchitis and emphysema; used to abort or check a cold. *Sexual organs:* **Emmenagogue,** used in many female troubles; probably **aphrodisiac** in small doses and **anaphrodisiac** in large doses; used for chordee, strangury, abnormal sexual appetite. Mild **diaphoretic, anthelmintic** against thread-worms. MONOBROMATED CAMPHOR is used like camphor, but chiefly in nervous troubles. CAMPHORIC ACID is used in colliquative sweats, and as an intestinal antiseptic. Large doses of camphor cause excitement, delirium, muscular weakness, feebleness of pulse, convulsions, collapse, death from respiratory failure.

Preparations and Doses.—Camphor, 1 to 10 gr. (0.06 to 0.6 Gm.). Spirit, 5 to 60 ♏ (0.3 to 4 Cc.). Water, ½ to 2 ℥ (2 to 8 Cc.). Liniment, Cerate. Monobromated camphor, 1 to 5 gr. (0.06 to 0.3 Gm.). Camphoric acid, 10 to 30 gr. (0.6 to 2 Gm.).

COTO.*

Synonym.—Coto bark.

Botanical Name.—Not determined. *Natural Order:* Lauraceæ. *Habitat:* South America.

Part Used.—Bark. *Adulterant:* Paracoto bark is largely substituted.

Description.—Curved or flat pieces, 1½ to 2½ in. (4 to 6 Cm.) wide, ⅕ to ⅗ in. (0.5 to 1.5 Cm.) thick, hard cinnamon brown, corky part largely removed, inner surface somewhat ridged; odor aromatic; taste pungent, then biting. Paracoto bark is similar but weaker and does not have the biting taste.

Active Principles.—Cotoin, Volatile oil.

Action and Uses.—Irritant externally and in the alimentary canal. **Tonic,** aiding absorption, checks salivation; **astringent,** chiefly used in diarrhea due to atony, also in cholera.

Doses.—1 to 15 gr. (0.06 to 1 Gm.). Cotoin, 1 to 2 gr. (0.06 to 0.12 Gm.).

OPIUM.

Synonyms.—Opium, Meconium, Succus thebaicus.

Botanical Name.—Pa-pa′-ver som-nif′-er-um. *Natural Order:* Papaveraceæ. *Habitat:* Asia (chiefly), Africa, Europe, North America.

Part Used.—Concrete exudation from capsules. *Adulterants:* Sand, shot, extract of capsules and plant; various gummy and saccharine substances; exhausted opium.

Description.—In irregular, flattened, more or less rounded masses of variable size, externally grayish brown, covered with remnants of poppy leaves and with occasional fruits of a species of *Rumex;* more or less plastic when fresh, but becoming hard on keeping; internally dark brown, somewhat lustrous; odor strong, narcotic; taste bitter and characteristic.

The poppy plant grows to a height of 2 to 4 feet, the white seed and flower variety and the brown seed and purple flower variety both being used. About a week after the petals have fallen several transverse or spiral incisions are made through the outer membrane of the capsule. The next morning the partially dried juice is scraped off with a blunt knife. The mass is further dried and mixed and later cured in warehouses and wrapped in rumex or poppy leaves. Most of the opium which comes to this market comes from Asia Minor, chiefly Smyrna, some from Constantinople, and some from Persia is imported for the extraction of morphine. Other varieties are Egyptian, Indian, and Chinese. It has been grown in the United States only for experimental purposes. Persian opium is often wrapped in paper, is in cylindrical, conical, or roundish masses, has an oily appearance. The Chinese opium amounts to 40,000,000 pounds annually, all of which is used at home besides large amounts imported.

Active Principles.—Morphine (U. S. P. requires not less than 9 per cent. in the gum and from 12 to 12.5 per cent. in the powdered, granulated, and deodorized opium), Codeine, Narcotine; about sixteen other alkaloids, combined with meconic and sulphuric acids.

Action and Uses.—External: Not absorbed through unbroken skin to any extent, but may be through an abraded surface or mucous membrane, acting on the central nervous system and but little on nerve terminations. **Anodyne,** used for sprains, bruises, neuralgia, rheumatism, and local pains; probably much of the good ascribed to it is due to other agents with which it is given and also the friction with which it is applied. *Alimentary canal:* In ordinary doses it produces dryness of mouth and throat, and frequently nausea and vomiting, though these more often follow recovery from sleep. It impairs digestion, lessens appetite, causes constipation by stimulating the inhibitory nerves, thereby lessening peristalsis and diminishing secretions. **Anodyne** in cancer of the stomach, acute gastritis, colic, peritonitis, passing of biliary and renal calculi, and all kinds of abdominal pain; bowels are usually kept open by saline cathartics. **Anti-emetic** in vomiting of gastralgia or colic. **Astringent** in certain diarrheas (after first removing the irritating matter if present), acute and chronic dysentery, cholera morbus. *Nervous system:* The principal action is exerted on this system. In small doses opium is said to stimulate the mental faculties, but this is probably not entirely correct; judgment and reason are decreased, but imagination and rapidity of thought are increased. Then follow a calm, contented feeling and light sleep, sometimes filled with pleasant, fantastical dreams. In moderate doses depression of the higher functions results and the patient falls into a dreamless sleep from which he can be aroused. As the dose is increased the sleep becomes deeper and passes into coma and torpor. The sleep from small or moderate doses may be refreshing, resembling natural sleep, but frequently on waking there are nausea, headache, and depression. These after-effects are said to be due to oxydimorphine formed by oxidation of morphine in the body. Opium depresses the centres in the medulla and reduces reflex activity. It is a powerful **analgesic, hypnotic,** and **narcotic** by causing anemia of the brain and lessened cell activity; its two main uses being to relieve pain and induce sleep. **Antispasmodic** to allay after-pains of labor and spasmodic contractions of bladder, urethra, and other organs; used in delirium

tremens (for temporary effect), mania, melancholia, uremic convulsions, cerebrospinal meningitis, puerperal eclampsia, severe burns, fractures, and many other cases where sleep and relief from pain are desired. For insomnia due to purely nervous causes, opium should not be used. If pain is very great, large doses must be given, as pain antidotes opium. **Antiphlogistic,** used with great benefit in some acute inflammations and febrile conditions. The physician should always keep in mind the liability of causing the wreck that the opium habit invariably produces. *Circulation:* Morphine injected hypodermically in small doses seems to act as a **cardiac stimulant.** Larger doses slow the heart by stimulating the vagus; blood pressure may be raised a little at first: vessels are unaffected except those in the skin which are dilated. **Analgesic** to relieve aneurisms, angina pectoris, cardiac diseases. **Hemostatic** for internal hemorrhages, being beneficial largely on account of its sedative effect and its lessening peristalsis, allowing the blood to clot. Atropine ($\frac{1}{120}$ gr. to $\frac{1}{4}$ gr. of morphine) counteracts some of the depressing effects and enhances the hypnotic and anodyne action. *Respiratory tract:* Slows respiration, making it deeper, then more shallow and irregular in later stages. Death results from paralysis of the respiratory centre usually. Opium diminishes bronchial irritation and secretion. **Expectorant,** used to allay coughing in coryza, bronchitis, pleurisy, pneumonia, but should not be used in the last stages of these diseases. **Antispasmodic** in certain cases of asthma. *Skin:* Opium increases perspiration and may produce redness and eruption; **diaphoretic** in the form of Dover's powder, for coryza and febrile attacks of various kinds. *Sexual organs:* Tends to stop menstruation and cause impotence. *Secretions:* Nearly all are diminished except milk and sweat, which are increased, the latter due to dilatation of cutaneous vessels. *Metabolism:* Generally lessened, diminished amount of urea and bile, sometimes transient albuminuria; beneficial in reducing sugar in urine of diabetic patients. *Elimination:* Largely with feces, to some extent in saliva, perspiration, and milk. Injected hypodermically it is excreted into the gastro-intestinal canal. The oxidation products can be detected in the urine, but

morphine only after large doses. *Idiosyncrasy:* Opium varies greatly in its effects on different individuals. It generally produces a quieting effect and sleep, but in quite a number of persons it causes only excitement, restlessness, and delirium; some do not suffer from nausea and other ill effects, while many do. Children are more susceptible than adults; females than males. *Toleration:* Ever-increasing doses are necessary to get the desired effect; some habitues take as much as a half pint of laudanum daily. The nerve cells become habituated and cease to be as active, and the system acquires a greater power of oxidizing morphine. *Comparison of morphine and opium:* Morphine is absorbed more quickly, is more certain, is more sedative, is more quickly eliminated; acts for a shorter time; causes more pruritus. Opium is more liable to cause indigestion, constipation, diaphoresis; reduces glycosuria more; is more stimulating.

Toxicology.—Acute poisoning: One minim of laudanum has killed an infant; 4 grains of opium and $\frac{1}{6}$ grain of morphine are the smallest fatal doses reported. *Symptoms:* Usually come on in one-half to one hour; the average duration of a fatal case is from seven to twelve hours. The symptoms may be divided into three stages: (1) Excitement. (2) Narcosis. (3) Coma. In the first the pulse is quickened, pupils contracted, face flushed; this quickly passes into the second stage; drowsiness, deep sleep, stupor, slowed circulation and respiration, may be vomiting, usually constipation. Narcosis passes into coma, face becoming cyanotic, body cold and clammy; breathing noisy, irregular, becoming slower, weaker and more shallow; pulse almost imperceptible, limbs relaxed, pupils strongly contracted, but may dilate just before death; death by paralysis of respiration, may be preceded by convulsions. Sometimes these symptoms are lacking, the person sinking into a deep sleep within a few minutes and dying in a few hours. Somewhat similar symptoms may be caused by alcohol (in which case the pupils are less contracted and patient more easily aroused); by phenol (note odor of it in the breath); by chloroform (notice the breath); by cerebral hemorrhage (one pupil is often contracted and the other dilated); by uremia (albumin in the urine). The history of

the case will aid diagnosis. *Treatment:* Give an emetic of mustard or apomorphine hydrochloride; wash out the stomach at short intervals; give small doses of potassium permanganate by the mouth repeatedly, as morphine is excreted into the stomach after absorption. Give strong, hot coffee by mouth and rectum; arouse patient if possible; keep him moving; flick with towel; give ammonia by inhalation or ether by hypodermic injection. Atropine sulphate ($\frac{1}{40}$ to $\frac{1}{20}$ gr.) has been advised, but there is danger of giving too much. Keep patient warm, give oxygen, resort to artificial respiration; continue treatment for several hours if necessary. *Chronic poisoning:* Morphine habit is quite common and may continue for months or years without detection. Opium is probably taken as much for its depression of sensibility, rendering the person oblivious to the miseries around him, as for the stimulating effect. The symptoms are loss of flesh, indigestion, constipation, dry skin, contracted pupils, irregular heart, nervousness, unfitness for work, a loss of all sense of honor, willingness to lie or steal in order to get the drug. In treating such a case the patient must be isolated and carefully watched. The dose should not be stopped suddenly, but reduced as fast as possible without producing too serious effects, generally within two or three weeks. Tonics, easily digested food, and hyoscine as a sedative are given. The cure is rarely permanent.

Preparation and Doses.—Powdered, Granulated, and Deodorized opium, $\frac{1}{4}$ to 2 gr. (0.015 to 0.12 Gm.). Extract, $\frac{1}{4}$ to 1 gr. (0.015 to 0.06 Gm.). Tincture, Tincture of deodorized opium, Tincture of ipecac and opium, Wine, and Vinegar, 5 to 20 ♏ (0.3 to 1.3 Cc.). Camphorated tincture (infant), 1 to 20 ♏ (0.06 to 1.3 Cc.); (adult) 1 to 4 ℥ (4 to 15 Cc.). Powder of ipecac and opium, 5 to 15 gr. (0.3 to 1 Gm.). Plaster, Pills, Troches of licorice and opium. Morphine, Morphine sulphate, Morphine acetate, and Morphine hydrochloride, $\frac{1}{8}$ to $\frac{1}{2}$ gr. (0.008 to 0.03 Gm.). Compound morphine powder, 5 to 15 gr. (0.03 to 1 Gm.).

CODEINA.

Action and Uses.—Codeine resembles morphine in many ways. However, it is less poisonous, less constipating, less depressing; sleep is less deep and restful; respiration is not slowed so much; less contraction of pupils; toleration and habit not so likely to be produced. Its chief use is to relieve coughing where cough is hacking and dependent upon an irritable, nervous condition; **analgesic** in long-continued pain; **anti-emetic** in vomiting from most any cause; used in glycosuria; **hypnotic.**

Heroine is a base derived from morphine and is used chiefly to allay coughing; may produce habit, but not so likely to as morphine. Dionine and peronine (bases derived from morphine) are used as analgesics and narcotics.

Doses.—Codeine, Codeine phosphate, and Codeine sulphate, $\frac{1}{4}$ to 2 gr. (0.015 to 0.12 Gm.). Heroine hydrochloride,* $\frac{1}{24}$ to $\frac{1}{6}$ gr. (0.0025 to 0.01 Gm.). Dionine,* $\frac{1}{6}$ to $\frac{1}{2}$ gr. (0.01 to 0.03 Gm.). Peronine,* $\frac{1}{3}$ to 1 gr. (0.02 to 0.06 Gm.).

APOMORPHINÆ HYDROCHLORIDUM.

Apomorphine is an artificial alkaloid obtained by the extraction of one molecule of water from the morphine molecule.

Action and Uses.—Alimentary canal: Produces emesis within ten or fifteen minutes after hypodermic injection by acting on the vomiting centre in the medulla; causes a little nausea which gradually passes off. One of the most certain, prompt, and least irritating of **emetics**; especially good in any case of poisoning. *Nervous system:* Chief effect is on the vomiting centre. In minute doses it has some **hypnotic** and **sedative** effect; used in delirium tremens, hiccough, angina pectoris. Large doses cause excitement, restlessness, depression of heart and respiration, delirium and convulsions. *Respiratory tract:* Increases and thins secretion from bronchial tubes, acting within one-half hour and lasting for two or three hours;

expectorant, used in bronchitis, catarrhal pneumonia, hacking coughs with scanty expectoration.

Doses.—Expectorant, $\frac{1}{40}$ to $\frac{1}{20}$ gr. (0.0015 to 0.003 Gm.); emetic, $\frac{1}{15}$ to $\frac{1}{10}$ gr. (0.004 to 0.006 Gm.).

SANGUINARIA.

Synonyms.—Bloodroot, Red Indian paint, Red root, Tetterwort.

Botanical Name.—San-gui-na'-ri-a can-a-den'-sis. *Natural Order:* Papaveraceæ. *Habitat:* North America.

Part Used.—Rhizome, collected after the death of the foliage.

Description.—Of horizontal growth, cylindrical, often somewhat branched, 1 to 3 in. (2.5 to 7 Cm.) long, $\frac{1}{5}$ to $\frac{3}{5}$ in. (5 to 15 Mm.) in diameter; externally reddish brown, slightly annulate; fracture short and somewhat waxy, brownish red or yellowish white with numerous reddish resin cells; odor slight, the powder sternutatory; taste persistently acrid and bitter.

Active Principles. — Sanguinarine, Chelerythrine, Protopine.

Action and Uses.—Powder is stimulant to ulcers, escharotic to fungous growths, sternutatory. Small doses stimulate gastric secretion and circulation; moderate doses cause nausea and circulatory depression; large doses produce intense thirst, burning, vomiting, vertigo, prostration, and collapse. Used chiefly as a stimulating **expectorant** in chronic bronchitis, croup, asthma, chronic nasal catarrh; alterative, sialagogue, emetic, emmenagogue.

Preparations and Doses.—Fluidextract, expectorant, 1 to 5 ♏ (0.06 to 0.3 Cc.); emetic, 10 to 30 ♏ (0.6 to 2 Cc.). Tincture, expectorant, 5 to 30 ♏ (0.3 to 2 Cc.); emetic, 1 to 3 ℥ (4 to 12 Cc.). Sanguinarine,* $\frac{1}{12}$ to $\frac{1}{2}$ gr. (0.005 to 0.03 Gm.).

CHELIDONIUM.*

Synonyms.—Garden or Great celandine.

Botanical Name.—Chel-i-do'-ni-um ma'-jus. *Natural Order:* Papaveraceæ. *Habitat:* Europe, North America.

Part Used.—Entire plant.

Description.—Root several headed, branched, reddish brown; stem, 1 to 2 feet (30 to 60 Cm.) long, light green, hairy; leaves long, thin, petiolate; upper ones smaller and sessile, light green, glaucous on under side; flowers in small, long-peduncled umbels, yellow; capsule linear, two-valved, many-seeded; odor narcotic; disagreeable, acrid taste.

Active Principles.—Chelidonine, Chelerythrine, Protopine.

Action and Uses.—Externally the juice is escharotic for warts. **Drastic purgative** and hepatic stimulant; used in jaundice, ascites, intermittent fever, but is rather unreliable. Resembles morphine in its effect on the nervous system. Diuretic, diaphoretic, emmenagogue.

Dose.—15 to 60 gr. (1 to 4 Gm.).

CORYDALIS.*

Synonyms.—Turkey corn, Squirrel corn, Wild hyacinth.

Botanical Name.—Di-a-cen'-tra can-a-den'-sis. *Natural Order:* Fumariaceæ. *Habitat:* North America.

Part Used.—Tuber.

Description.—Often three together, $\frac{1}{5}$ to $\frac{2}{5}$ in. (5 to 10 Mm.) thick, nearly smooth, scars on depressed sides, yellow gray, lighter inside, horny; odorless; bitter.

Active Principle.—Corydaline.

Action and Uses.—**Alterative** in syphilis, scrofula, and skin diseases.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

SINAPIS ALBA.

Synonyms.—White mustard, Yellow mustard.

Botanical Name.—Si-na′-pis al′-ba. *Natural Order:* Cruciferæ. *Habitat:* Europe, Asia, North America.

Part used.—Seed. *Adulterants:* Flour, starch, sawdust, tumeric.

Description.—Subglobular, $\frac{1}{25}$ to $\frac{1}{12}$ in. (1 to 2 Mm.) in diameter; testa yellowish, minutely pitted; embryo yellowish, oily, with a curved hypocotyl and two conduplicate cotyledons; inodorous; taste mildly pungent and acrid. The powder contains few or no starch grains.

Active Principles.—Fixed oil, Sinalbin (decomposed by ferment in presence of water, yielding an acrid, non-volatile oil).

Action and Uses.—Similar to those of black mustard, but weaker.

SINAPIS NIGRA.

Synonyms.—Black mustard, Red mustard.

Botanical Name.—Bras′-si-ca ni′-gra. *Natural Order:* Cruciferæ. *Habitat:* Europe, Asia, North America.

Part Used.—Seed. *Adulterants:* Turnip and rape seed, flour, tumeric, capsicum.

Description.—Subglobular, about $\frac{1}{25}$ in. (1.2 Mm.) in diameter; testa deep red brown, sometimes with a grayish tinge, minutely pitted; embryo greenish yellow, oily, with a curved hypocotyl and two conduplicate cotyledons; nearly odorless when dry, powerfully irritating on moistening; taste strongly pungent and acrid. The powder contains few or no starch grains.

The table mustard or mustard flour is generally a mixture of the black and white; often the fixed oil is partly removed and the powder mixed with starchy matter.

Active Principles.—Fixed oil, Sinigrin (decomposed by a ferment in the presence of water, yielding the volatile oil of mustard).

Action and Uses.—External: Dilates peripheral blood-vessels; irritates, then paralyzes sensory nerves; reflexly stimulates circulation, respiration, and nervous system. The oil is more penetrating than most oils. Poultice may be made by mixing mustard flour with luke-warm water or vinegar, or first diluting the flour with linseed meal; hot water should not be used, as it destroys the ferment which causes the formation of the oil; the poultice should not be left on too long, as it may produce vesication and the blister is painful and heals slowly. **Irritant** and **counterirritant**, applied to epigastrium in case of gastralgia, colic, vomiting; applied to chest in case of inflammation of respiratory tract; applied to nape of neck in case of headache; applied to loins in case of suppression of urine; applied to calves of legs in narcotic poisoning, asphyxia, or syncope; foot bath in case of colds, febrile conditions, internal congestion; sitz bath in case of suppressed menstruation. *Internal:* Increases appetite, and gastric juice; continued use may cause gastritis; **stomachic** and **condiment**, used in atonic dyspepsia. Large doses produce emesis by irritating the stomach; little or no depression on account of the reflex stimulating effect; one of the best of direct **emetics**; used in indigestion and poisoning, particularly by narcotics.

Preparations and Doses.—Of powder, as emetic, 1 to 4 ʒ (4 to 15 Gm.). Oil, ⅛ to ½ ♏ (0.008 to 0.03 Cc.). Paper.

ARMORACIA.*

Synonyms.—Cochlearia, Horseradish.

Botanical Name.—Ro-ri′-pa ar-mo-ra′-ci-a. *Natural Order:* Cruciferæ. *Habitat:* Europe, North America.

Part Used.—Fresh root.

Description.—From 8 to 20 in. (20 to 50 Cm.) long, ½ to 1½ in. (1.2 to 3.7 Cm.) thick, tapering, one or more short crowns, thin bark, yellowish brown outside, white inside; pungent odor; biting, acrid taste.

Active Principle.—Volatile oil (formed from a glucoside by a ferment).

Action and Uses.—Similar to mustard. Condiment chiefly.

HAMAMELIDIS CORTEX. HAMAMELIDIS FOLIA.

Synonyms.—Witch-hazel, Snapping hazel, Winter bloom. *Botanical Name.*—Ham-a-me′-lis vir-gin-i-a′-na. *Natural Order:* Hamamelidaceæ. *Habitat:* North America.

Parts Used.—Bark, twigs, and leaves.

Description.—Bark and Twigs: In irregularly quilled or bent pieces $\frac{1}{25}$ to $\frac{1}{12}$ in. (1 to 2 Mm.) thick; grayish brown, with numerous lenticels, or reddish brown, with short, transverse ridges or scars, or somewhat scaly in older bark; the thin, corky layer easily removed from the pale cinnamon-colored middle bark; inner surface pale cinnamon-colored, or yellowish, smooth, or finely striate; fracture short or tough; odor faint; taste astringent, somewhat bitter. Twigs flexible and tough, of irregular length, not more than $\frac{1}{4}$ in. (6 Mm.) in diameter, branching, or bearing nodes at intervals of $\frac{4}{5}$ to 2 in. (2 to 5 Cm.); yellowish brown to deep purplish brown, lightly longitudinally wrinkled, and having scattered, small, circular, whitish or pale lenticels; wood greenish white, lightly radiate, and exhibiting one to three annual rings; pith centric, small.

Leaves: Short petiolate; blade inequilaterally obovate or oval, about 4 in. (10 Cm.) long; base slightly heart-shaped and oblique, margin coarsely sinuate; upper surface pale or brownish green; under surface light green, with a satiny lustre, the midrib and veins prominent, few hairs; petiole short, stout; odor slight; taste astringent, slightly aromatic and bitter.

Active Principles.—Tannin, Volatile oil.

Action and Uses.—Great claims have been made for certain preparations of this drug, but aside from the effect of the tannin the good produced is due largely to the alcohol present, the friction used, and the imagination. *External:* **Astringent, hemostatic,** and **sedative** for sprains, bruises, wounds, sores, pruritus, bleeding hemorrhoids, and headache. *Internal:* Recommended as styptic in hemorrhage from alimentary canal, nose, lungs, kidneys, uterus; used in diarrhea, dysentery, varicose veins.

Preparations and Doses.—Water from bark, 1 to 4 ʒ (4 to 15 Cc.). Fluidextract from leaves, 5 to 60 ♏ (0.3 to 4 Cc.).

STYRAX.

Synonyms.—Storax, Liquid storax, Oriental sweet gum.

Botanical Name.—Liq-uid-am'-bar o-ri-en-tal'-is. *Natural Order:* Hamamelidaceæ. *Habitat:* Asia Minor.

Part Used.—Balsam from wood and inner bark. *Adulterants:* Turpentine, mineral matter, water.

Description.—A semi-liquid, grayish, sticky, opaque mass, depositing, on standing, a heavy, dark-brown stratum; transparent in thin layers, and having an agreeable odor and a balsamic taste. Storax is a pathological product, obtained by bruising the bark, rejecting the outer part and boiling the inner bark with water, and skimming off the balsam. Sweet gum, from Liquidambar styraciflua is similar in properties to storax, but is chiefly used in flavoring chewing gum.

Active Principles.—Volatile oil (styrol), Resins, Cinnamic and Benzoic acids, Vanillin.

Action and Uses.—Similar to balsam Peru, balsam Tolu, or benzoin. *External:* Chiefly a **stimulant** and **disinfectant** for ulcers and skin diseases; **parasiticide** for scabies and pediculi. *Internal:* Stimulant for chronic catarrh of the lungs and genito-urinary tract.

Preparations and Doses.—Balsam, 10 to 20 gr. (0.6 to 1.3 Gm.). Compound tincture of benzoin, 15 to 60 ♏ (1 to 4 Cc.).

HEUCHERA.*

Synonyms.—Alum-root, Split-rock.

Botanical Name.—Heu'-che-ra a-mer-i-ca'-na. *Natural Order:* Saxafragaceæ. *Habitat:* North America.

Part Used.—Rhizome.

Description.—About 6 in. (15 Cm.) long, and ½ in. (1.2 Cm.) thick, several heads, somewhat conical and branched;

bark thin, shriveled, purplish brown; odorless; bitter, astringent taste.

Active Principle.—Tannin.

Action and Uses.—Similar to tannic acid. Used much more formerly than now.

Dose.—15 to 30 gr. (1 to 2 Gm.).

HYDRANGEA.*

Synonym.—Seven-barks.

Botanical Name.—Hy-dran′-ge-a ar-bo-res′-cens. *Natural Order:* Saxifragaceæ. *Habitat:* North America.

Part Used.—Root.

Description.—Branched, from $\frac{1}{8}$ to $\frac{1}{2}$ in. (3 to 12 Mm.) in diameter; pale-yellow to brownish-white, hard, thin bark; pith that is easily removed; Aromatic, pungent odor and taste.

Active Principles.—Hydrangin, Volatile oil.

Action and Uses.—**Diuretic** for gravel, nephritis; alterative, narcotic.

Dose.—15 to 60 gr. (1 to 4 Gm.).

RUBUS.

Synonyms.—Blackberry. (1) European high-bush blackberry, Dewberry. (2) American high-bush blackberry. (3) Sand blackberry, Knee-high blackberry.

Botanical Names.—(1) Ru′-bus vil-lo′-sus. (2) R. ni-gro-bac′-cus. (3) R. cu-ne-i-fo′-li-us. *Natural Order:* Rosaceæ. *Habitat:* Europe, North America.

Part Used.—Bark of rhizome.

Description.—In elongated, tough, flexible quills, from $\frac{1}{8}$ to $\frac{1}{4}$ in. (3 to 6 Mm.) in diameter, or in bands; outer surface deep red brown to gray or black brown, smooth or somewhat scaly; inner surface yellow or pale brownish; strongly and coarsely long, straight striate; fracture tough fibrous, readily splitting; inodorous; taste strongly astringent and bitterish.

The fruit of Rubus idæus, raspberry, was formerly official; used in making a flavoring syrup.

Active Principles.—Tannin, Villosin.

Action and Uses.—Similar to tannic acid. Favorite domestic remedy for summer diarrhea.

Preparations and Doses.—Fluidextract 15 to 60 ♏ (1 to 4 Cc.). Syrup, ½ to 2 ℥ (2 to 8 Cc.).

GEUM.*

Synonyms.—Purple, Water, or Drooping avens.

Botanical Name.—Ge′-um ri-va′-le. *Natural Order:* Rosaceæ. *Habitat:* North America.

Part Used.—Rhizome.

Description.—From 2 to 3 in. (5 to 7.5 Cm.) long, wrinkled, tuberculate, thin bark, fracture short, large pith, brownish; aromatic odor; bitter, astringent taste.

Active Principles.—Tannin, Volatile oil.

Action and Uses.—Astringent and alterative.

Dose.—15 to 30 gr. (1 to 2 Gm.).

ROSA GALLICA.

Synonyms.—Red rose, French rose.

Botanical Name.—Ro′-sa gal′-li-ca. *Natural Order:* Rosaceæ. *Habitat:* Europe, Asia, cultivated.

Part Used.—Petals.

Description.—Usually in small cones, consisting of numerous imbricated, roundish, deep purplish-red, yellow-clawed petals, having a characteristic odor and a bitterish, slightly acidulous, and distinctly astringent taste.

Unopened buds are more astringent and of better color if collected early and dried quickly.

Active Principles.—Volatile oil, Tannin, Coloring principle.

Action and Uses.—Used chiefly for odor and flavor, formerly as mild astringent.

Preparations and Doses.—Fluidextract, 1 to 2 ℥ (4 to 8 Cc.). Syrup, Honey.

ROSA CENTIFOLIA.*

Synonyms.—Pale rose, Cabbage or Hundred-leaved rose. *Botanical Name.*—Ro′-sa cen-ti-fo′-li-a. *Natural Order:* Rosaceæ. *Habitat:* Asia, cultivated.

Part Used.—Petals.

Description.—Roundish obovate and retuse, or obcordate; fragrant odor; sweetish, slightly bitter, astringent taste. The species largely used for obtaining the oil is Rosa damascena, damask rose. The petals are distilled with water and the aqueous distillate used repeatedly for fresh distillations. The stronger rose-water, U. S. P., is part of the aqueous distillate.

Active Principle.—Volatile oil.

Use.—Flavoring agent.

QUILLAJA.

Synonym.—Soap bark.

Botanical Name.—Quil-la′-ja sap-o-na′-ri-a. *Natural Order:* Rosaceæ. *Habitat:* South America.

Part Used.—Inner bark.

Description.—In flat pieces of variable length, ⅛ to ⅓ in. (3 to 8 Mm.) thick, or in small chips; outer surface brownish white, often with small patches of cork attached, otherwise nearly smooth; inner surface yellowish white, nearly smooth, with occasional circular depressions, conical projections or transverse channels, numerous crystals of calcium oxalate; fracture uneven and strongly fibrous, the lamina oblique to each other; odor slight, sternutatory; taste acrid. Aqueous extract froths like soap.

Active Principle.—Saponin. (Probably a mixture of Quillajic acid and Sapotoxin.)

Action and Uses.—External: **Stimulating** lotion for ulcers and skin diseases; **sternutatory** in rhinitis; emulsifying agent,

but is too irritating for general use. *Internal:* **Expectorant** where mucus is thick and tenacious; pleasant substitute for senega.

Preparations and Uses.—Fluidextract, 1 to 10 ♏ (0.06 to 0.6 Cc.). Tincture, 5 to 60 ♏ (0.3 to 4 Cc.).

CUSSO.

Synonyms.—Kousso, Brayera, Cosso, Kusso, Kooso.

Botanical Name.—Ha-ge′-ni-a ab-ys-sin′-i-ca. *Natural Order:* Rosaceæ. *Habitat:* Africa.

Part Used.—Panicles of pistillate flowers. *Adulterants:* Male flowers, stems.

Description.—In rolls or compressed bundles from 10 to 16 in. (25 to 40 Cm.) long, reddish brown, each branch arising from the axil of a sheathing bract, and each flower furnished at its base with two rounded bracts; calyx-tube top-shaped, pubescent, and bearing a circle, resembling an outer calyx, of five rigid, spreading, obovate bracts, which are larger than the five usually shrivelled and incurved, oval calyx lobes; carpels two; styles exserted and stigmas broad and hairy; odor slight; taste bitter. The large stems should be rejected.

Active Principles.—Kosin, Kosotoxin.

Action and Uses.—**Teniacide** for tapeworms. Reports show varying success, some saying that the head is rarely expelled, others that the worm is usually expelled within twenty-four hours. The drug is liable to cause nausea and is hard to retain. If no movement of the bowels results in eight hours a cathartic should be given. It may tend to cause abortion. Kosin is said to be less irritating. Flowers should be fresh.

Doses.—2 to 8 ʒ (8 to 30 Gm.). Kosin, 5 to 30 gr. (0.3 to 2 Gm.).

PRUNUS VIRGINIANA.

Synonyms.—Wild cherry; Black, Rum, Whisky, or Cabinet cherry.

Botanical Name.—Pru'-nus se-rot'-i-na. *Natural Order:* Rosaceæ. *Habitat:* North America.

Part Used.—Bark. *Adulterants:* Bark of old stems, bark of choke cherry.

Description.—Usually in transversely curved pieces from 1 to 3 in. (3 to 7 Cm.) long, outer surface brown to greenish brown, smooth, with numerous lenticels; inner surface light brown, somewhat reticulately striate or fissured; fracture short, granular; having a bitter-almond-like odor when macerated in water; taste astringent, aromatic, and agreeably bitter. Must not be confused with choke cherry (Prunus virginiana).

Active Principles.—Amygdalin, which is decomposed by a ferment in the presence of water, yielding hydrocyanic acid and benzaldehyde.

Action and Uses.—Aromatic bitter **tonic** in general debility, atonic dyspepsia, convalescence from acute diseases; **sedative**, to diminish reflex excitability in coughs. Syrup is a common vehicle for cough meidcines. The amount of hydrocyanic acid is too small to produce much effect.

Preparations and Doses.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.). Infusion, ½ to 3 ℥ (15 to 90 Cc.). Syrup, ½ to 4 ℥ (2 to 15 Cc.).

LAUROCERASUS.*

Synonym.—Cherry laurel.

Botanical Name.—Pru'-nus lau-ro-ce-ra'-sus. *Natural Order:* Rosaceæ. *Habitat:* Asia, Europe.

Part Used.—Leaves.

Description.—About 6 in. (15 Cm.) long, oblong, serrate, thick, dark green above, lighter beneath; bitter-almond odor when bruised; aromatic, bitter taste.

Active Principles.—Laurocerasin, which is decomposed by a ferment in the presence of water, yielding hydrocyanic acid and benzaldehyde.

Uses.—Sedative and for making cherry-laurel water.

PRUNUM.

Synonym.—Prunes.

Botanical Name.—Pru'-nus do-mes'-ti-ca. *Natural Order:* Rosaceæ. *Habitat:* Asia, cultivated.

Part Used.—Fruit.

Description.—Oblong, ellipsoidal, more or less compressed, 1 to 1½ in. (3 to 4 Cm.) long; externally brownish black, shrivelled; the sarcocarp sweet and acidulous; putamen hard, smooth or irregularly ridged; the seed, shaped like that of the almond but smaller, and of a bitter-almond taste.

Active Principle.—Sugar.

Action and Uses.—Nutritive and **laxative** in habitual constipation.

Preparation and Dose.—Confection of senna, 1 to 2 ℥ (4 to 8 Gm.).

AMYGDALA AMARA.

Synonym.—Bitter almond.

Botanical Name.—Pru'-nus a-myg'-da-lus var. amara. *Natural Order:* Rosaceæ. *Habitat:* Asia, cultivated in subtropics.

Part Used.—Seed. *Adulterants:* Sweet almond, peach seed.

Description.—Ovate or oblong lanceolate, ⅘ to ⅚ in. (20 to 30 Mm.) long; seed coat thin, brown, finely downy; embryo straight, white, and with two planoconvex cotyledons; taste bitter and oily; when triturated with water bitter almond yields a milk-white emulsion which emits an odor of hydrocyanic acid. The bitter almonds are shorter, thinner, less plump, and darker than the sweet.

Active Principles.—Fixed oil; Amygdalin, which is decomposed by a ferment, yielding hydrocyanic acid and benzaldehyde.

Action and Uses.—Bitter almonds in the form of an emulsion is a dumulcent, nutritive, emollient, **sedative** vehicle for disagreeable medicines, particularly **expectorants.** The volatile oil is used in cough mixtures and as a flavoring.

Preparations and Doses.—Volatile oil and Benzaldehyde, ¼ to 1 ♏ (0.015 to 0.06 Cc.). Spirit, 5 to 10 ♏ (0.3 to 0.6 Cc.). Syrup, ½ to 1½ ℥ (2 to 6 Cc.). Water, ½ to 3 ℥ (2 to 12 Cc.).

AMYGDALA DULCIS.

Synonym.—Sweet almond.

Botanical Name.—Pru′-nus a-myg′-da-lus var. dulcis. *Natural Order:* Rosaceæ. *Habitat:* Asia, cultivated in subtropics.

Part Used.—Seed.

Description.—Closely resembling bitter almond, but usually broader, with lighter seed coat; odorless even when triturated with water; bland, sweetish taste.

Active Principle.—Fixed oil.

Action and Uses.—The seed in the form of an emulsion and the oil in the form of an ointment are used as **emollients** on chapped hands, excoriations, skin diseases. Almond meal is used for the toilet. The fixed oil resembles olive oil, but is pleasanter; used as a **laxative.** Biscuits from almond flour are used by diabetic patients because it contains no starch.

Dose.—Oil, 1 to 8 ℥ (4 to 30 Cc.).

CYDONIUM.*

Synonym.—Quince seed.

Botanical Name.—Cy-do′-ni-a cy-do′-ni-a. *Natural Order:* Rosaceæ. *Habitat:* Asia, cultivated.

Part Used.—Seed.

Description.—From $\frac{1}{5}$ to $\frac{2}{5}$ in. (5 to 10 Mm.) long, oval or oblong, triangularly compressed, one end somewhat beaked; brown with whitish, mucilaginous epithelium; swells to mucilaginous mass in water; odorless; oily, gummy taste.

Active Principle.—Mucilage.

Action and Uses.—**Emollient** for abrasions of skin, conjunctivitis; **demulcent** for irritation of throat, stomach, and intestines; vehicle.

ACACIA.

Synonyms.—Gum arabic, Gum senegal.

Botanical Name.—A-ca′-cia sen′-e-gal, and other species. *Natural Order:* Leguminosæ. *Habitat:* Africa.

Part Used.—Gummy exudation. *Adulterants:* Gums from other plants, dextrin, sand, flour, starch, mineral matter.

Description.—In roundish tears of various sizes, or broken into angular fragments; whitish or yellowish white, translucent; very brittle, with a glass-like, sometimes iridescent fracture; nearly inodorous; taste insipid, mucilaginous; insoluble in alcohol; slowly and completely soluble in water, forming an odorless, mucilaginous liquid. The powder contains few or no starch grains or fragments of vegetable tissues.

The terms "acacia" and gum "senegal" are not entirely synonymous, the former coming largely from A. vera; gum senegal does not have as many fissures in it, is more glassy, darker, less angular, and less soluble. There are several commercial varieties, depending upon the place grown, as Egyptian, Senegal, Barbary, Indian. Acacia is sorted into grades at the places of export. It is probably a waste product of the tree, the result of change of cell wall or contents, occurring in the inner bark. The gum seems to be most plentiful in diseased trees and in dry, hot weather. Some of the gums made to replace acacia are Wattle, Suakin, Ghedda, Mesquit. Some artificial substitutes, generally made from other mucilages or starch, are used.

Active Principles.—Arabic acid combined with calcium (chiefly), potassium, and magnesium.

Action and Uses.—**Demulcent** in inflammation of the bronchial or gastro-intestinal mucous membrane, as in coughs, sore throat, irritant poisons; vehicle, suspending or emulsifying agent.

Preparations and Doses.—Mucilage, 2 to 8 ℥ (8 to 30 Cc.). Syrup, indefinite amount.

CATECHU.*

Synonyms.—Black catechu, Cutch.

Botanical Name.—A-ca'-cia cat'-e-chu. *Natural Order:* Leguminosæ. *Habitat:* Asia.

Part Used.—Extract from heart-wood. *Adulterants:* Leaves, sand, mineral matter, sticks, blood, starch.

Description.—Irregular masses, containing fragments of leaves, somewhat porous and shiny when freshly broken, dark brown, nearly odorless; astringent taste. Obtained by removing bark and sap-wood, then cutting the heart-wood into chips, boiling them, straining, evaporating, pouring on to leaves or into molds. In the U. S. P., catechu has been replaced by gambir, which comes from an entirely different plant, but has similar properties and makes up much of the commercial catechu.

Active Principles.—Catechu-tannic acid, Catechin.

Action and Uses.—Similar to tannic acid; **astringent**, particularly in spongy gums, serous or mucous diarrhea, gonorrhea, leucorrhea.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

CASSIA FISTULA.

Synonyms.—Purging cassia, Pudding-stick.

Botanical Name.—Cas'-si-a fis-'tu-la. *Natural Order:* Leguminosæ. *Habitat:* Africa, cultivated in West Indies and South Africa.

Part Used.—Fruit.

Description.—Cylindrical, 10 to 20 in. (25 to 50 Cm.) long, about $\frac{4}{5}$ in. (20 Mm.) in diameter, chestnut brown in color,

on one side a longitudinal groove and on the other a smooth line or slight ridge, indicating the two sutures; indehiscent, the cavity divided transversely into numerous compartments, each containing a reddish-brown, glossy, flattish-ovoid seed embedded in a blackish-brown pulp; odor resembling that of prunes, and a mawkish, sweet taste. The heavy pods that do not rattle are the best.

Active Principles.—Sugar, Mucilage.

Action and Uses.—**Laxative** in habitual constipation; usually in combination, as in confection of senna. Large doses cause griping, nausea, and flatulence.

Dose.—1 to 2 ʒ (4 to 8 Gm.).

SENNA.

Synonyms.—(1) Alexandria or Nubian senna. (2) Indian or Tinnevelly senna.

Botanical Names.—(1) Cas'-si-a a-cu-te-fo'-li-a. (2) C. an-gus-ti-fo'-li-a. *Natural Order:* Leguminosæ. *Habitat:* Africa, Asia.

Part Used.—Leaflets. *Adulterants:* Leaves of other species, argel leaves, foreign leaves, pods, stems, sticks, stones.

Description.—Alexandria Senna: Leaflets about 1 in. (25 Mm.) long, and $\frac{2}{5}$ in. (10 Mm.) broad, having extremely short, stout petioles; inequilaterally lanceolate or lance-ovate, acutely cuspidate, entire, subcoriaceous, brittle, pale green or grayish green, sparsely and obscurely hairy, especially beneath, the hairs appressed, 1-celled, and thick-walled; odor characteristic; taste somewhat mucilaginous and bitterish.

India Senna: Leaflets inequilaterally lanceolate, entire, thin, longer, a little broader and more abruptly pointed than those of Alexandria senna; yellowish green and smooth above, paler beneath; in odor and taste closely resembling Alexandria senna.

The senna plants are small shrubs and yield two crops a year. Sometimes the whole plant is cut and dried and leaves

stripped off. The garbling is usually done at the city of export by picking out the larger adulterants and sifting out the broken leaves and dirt; the leaves being separated into different sizes. Tripoli senna comes from Central Africa and contains broken and discolored leaves, and foreign matter. American senna (Cassia marilandica) is similar, but weaker.

Active Principles.—Emodin, Chrysophanic acid.

Action and Uses.—Increases peristalsis and intestinal secretion, producing a liquid stool in about 4 to 6 hours; causes considerable griping, which can be lessened by first dissolving out the odorous resin with strong alcohol and using aromatics; the secretion of bile is not increased and there is no subsequent constipation. **Laxative** for habitual constipation or constipation of pregnancy; continued use may cause hemorrhoids. Eliminated to some extent in the milk; colors urine yellow if acid, or red if alkaline.

Preparations and Doses.—Fluidextract, ¼ to 2 ℥ (1 to 8 Cc.). Compound infusion, 2 to 6 ℥ (60 to 180 Cc.). Syrup, ½ to 2 ℥ (2 to 8 Cc.). Confection and Compound licorice powder, ½ to 2 ℥ (2 to 8 Gm.).

DIPTERYX.*

Synonyms.—Tonka bean, Snuff bean.

Botanical Name.—Dip'-ter-yx o-dor-a'-ta. *Natural Order:* Leguminosæ. *Habitat:* Tropical America.

Part Used.—Seed.

Description.—From 1 to 2 in. (2.5 to 5 Cm.) long, ½ to 1 in. (1.2 to 2.5 Cm.) broad, oblong, somewhat flattened, one edge sharper than the other, rounded at ends, brownish black, oily appearance; wrinkled, fatty-like skin; sometimes showing crystals of cumarin; two brown cotyledons, with a little space between; aromatic, vanilla odor; aromatic, bitter taste. Like vanilla, the odoriferous principle is developed in the curing. Cumarin is found in many plants and is made synthetically.

Active Principle.—Cumarin.

Action and Uses.—Chiefly in perfumery and cheap vanilla extract; to cover up odor of iodoform. Not much used in medicine; antispasmodic and narcotic.

MELILOTUS.*

Synonyms.—Sweet clover, Meliot, Sweet lucerne.

Botanical Name.—Mel-i-lo′-tus of-fi-ci-na′-lis. *Natural Order:* Leguminosæ. *Habitat:* Europe, North America.

Part Used.—Flowering tops.

Description.—Plant 3 to 6 feet (1 to 2 M.) high; flowers in rounded, loose racemes, yellow white; stems angular; leaves serrate, trifoliate; odor fragrant, tonka-like; aromatic, bitter taste.

Active Principle.—Cumarin.

Action and Uses.—Anodyne, in form of a poultice; **antispasmodic** in whooping-cough. Trifolium pratense, red clover, is used as an alterative.

FŒNUM GRÆCUM.*

Synonym.—Fenugreek.

Botanical Name.—Trig-o-nel′-la fœ-num′ græ′-cum. *Natural Order:* Leguminosæ. *Habitat:* Asia, Africa, and Europe.

Part Used.—Seed.

Description.—Yellowish to brownish, rhomboidal, somewhat compressed, often shrivelled, hard, deep furrow partly dividing the seed unequally; odor suggestive of slippery elm; bitter, mucilaginous taste.

Active Principles.—Mucilage, Trigonelline.

Uses.—Emollient, similar to slippery elm; demulcent in veterinary condition powder.

TAMARINDUS.

Synonym.—Tamarind.

Botanical Name.—Tam-a-rin′-dus in′-di-ca. *Natural Order:* Leguminosæ. *Habitat:* Asia, Africa, West Indies.

Part Used.—Preserved pulp of fruit.

Description.—A pulpy mass of a light reddish-brown color, darkening with age so as to become dark brown, containing some branching fibers and numerous reddish-brown, smooth, oblong or quadrangular, compressed seeds, each enclosed in a tough membrane; odor distinct; taste sweet and agreeably acid. This market is supplied from the West Indies, where the shells are removed and the inner part is mixed with syrup; occurs in jars; Egyptian occurs in cakes.

Active Principles.—Citric acid, Tartaric acid, Potassium bitartrate.

Action and Uses.—**Laxative** for habitual constipation, generally given in combination; refrigerant in the form of infusion.

Dose.—1 to 8 ʒ (4 to 30 Gm.).

HÆMATOXYLON.

Synonym.—Logwood.

Botanical Name.—Hæ-ma-tox′-y-lon cam-pe-chi-a′-num. *Natural Order:* Leguminosæ. *Habitat:* Central America, West Indies.

Part Used.—Heart-wood.

Description.—Usually in small chips, freshly cut surface, yellowish red, turning reddish brown; a greenish, metallic lustre shows the wood has undergone fermentation and should be rejected; transverse section shows medullary rays; odor faint, agreeable; sweetish, astringent taste. Obtained by cutting down trees when about ten years old; removing bark and sap-wood and cutting into logs, which are imported and cut into chips or coarse powder.

Active Principles.—Hæmatoxylin, Tannin.

Action and Uses.—Mild **astringent** and **tonic,** non-irritating, used in diarrheas of relaxation and of infants; colors urine, stools, and clothing; astringent and antiseptic in ulcers, leucorrhea, and bleeding piles.

Preparation and Dose.—Extract, 10 to 30 gr. (0.06 to 2 Gm.).

ERYTHROPHLŒUM.*

Synonyms.—Sassy bark, Mancona bark, Casca bark.

Botanical Name.—Er-y-thro-phlœ′-um gui-ne-en′-se. *Natural Order:* Leguminosæ. *Habitat:* Africa.

Part Used.—Bark.

Description.—Warty, flat, or curved; reddish brown, grayish if outside cork is present; irregularly fissured, hard; odorless; astringent, bitter taste. Used by natives in trying cases of witchcraft.

Active Principles.—Erythrophlœine, Tannin.

Action and Uses.—Resembles **digitalis** in action on the heart, but is more of a gastro-intestinal irritant, less reliable, less cumulative; diuretic, astringent, emetic, narcotic; alkaloid is a local **anesthetic,** but more poisonous and inferior to cocaine.

Dose.—Erythrophlœine, $\frac{1}{60}$ to $\frac{1}{8}$ gr. (0.001 to 0.008 Gm.).

COPAIBA.

Synonym.—Balsam of copaiba.

Botanical Name.—One or more species of Copaiba, probably largely from C. langsdorffii. *Natural Order:* Leguminosæ. *Habitat:* South America.

Part Used.—Oleoresin. *Adulterants:* Removal of some of the oil; addition of resin, fixed oils, volatile oils, paraffin oils, gurjun balsam.

Description.—A pale-yellow to brownish-yellow, more or less transparent and viscid liquid, sometimes fluorescent; having a peculiar, aromatic odor and a persistent, bitter, acrid taste. Gets thicker with age. Probably a pathogenic product which occurs in ducts in trees and is obtained by boring into the centre of the tree. Several commercial varieties, depending upon the place of export; Para is the thinnest, has the most oil, and is the best; Maracaibo is the thickest, has most resin, and is the best for making mass of copaiba.

Active Principles.—Volatile oil, Resins.

Action and Uses.—External: Has been used as a stimulant and **antiseptic** for sore nipples; chronic skin diseases, as psoriasis, lupus, leprosy. *Alimentary canal:* Causes eructations and, if continued, gastro-enteritis. *Elimination:* In bronchial mucus, sweat, milk, and urine, **stimulating** and **disinfecting** secretions and the mucous membranes through which it passes; may cause itching and an eruption resembling measles. *Genito-urinary tract:* Urine is increased, particularly by the resin, and acquires a peculiar odor; resin in the urine may be precipitated in testing for albumin; **diuretic** for dropsies; chiefly used for subacute and chronic stages of gonorrhea and gleet where it is very effective.

Doses.—15 to 60 ♏ (1 to 4 Cc.). Oil, 5 to 15 ♏ (0.3 to 1 Cc.).

BALSAMUM PERUVIANUM.

Synonym.—Balsam of Peru.

Botanical Name.—To-lu-if'-e-ra per-ei'-ræ. *Natural Order:* Leguminosæ. *Habitat:* Central America.

Part Used.—Balsam. *Adulterants:* Fixed and volatile oils, gurjun balsam, copaiba, alcohol, rosin, storax.

Description.—A viscid, dark-brown liquid; free from stringiness or stickiness; transparent and reddish brown in thin layers; of an agreeable vanilla-like odor and a bitter, acrid taste, with a persistent after-taste. It does not harden on exposure to the air. Obtained by removing bark in strips or patches, applying rags to absorb exudation, later heating

to get another yield. The rags are boiled in water to separate the balsam.

Active Principles.—Volatile oil (cinnamein), Resin, Benzoic and Cinnamic acids.

Action and Uses.—Chiefly externally as a **stimulant** and **antiseptic** for sore nipples, wounds, indolent ulcers, eczema; **parasiticide** against pediculi, ringworm, scabies, pruritus. Internally it is an **expectorant**; used for bronchitis, asthma, tuberculosis; stimulating **disinfectant** to the mucous membrane of the alimentary canal, respiratory and genito-urinary tracts; stomachic, carminative, cardiac stimulant, deodorant of iodoform.

Dose.—5 to 15 gr. (0.3 to 1 Gm.).

BALSAMUM TOLUTANUM.

Synonym.—Balsam of Tolu.

Botanical Name.—To-lu-if'-e-ra bal'-sa-mum. *Natural Order:* Leguminosæ. *Habitat:* South America.

Part Used.—Balsam. *Adulterants:* Resin, storax, resinous substances, turpentine, copaiba.

Description.—A yellowish-brown, plastic solid, becoming brittle when old, dried, or exposed to cold. It is transparent in thin layers; has a pleasant, aromatic odor, recalling that of vanilla, and a mild, aromatic taste. It rarely occurs as a very thick liquid. Obtained as a pathological product, the result of V-shaped incisions through the bark.

Active Principles.—Volatile oil, Resin, Benzoic and Cinnamic acids.

Action and Uses.—Similar to balsam of Peru, but less of a stimulating disinfectant. Used chiefly as an **expectorant** and flavoring agent, particularly the syrup.

Preparations.—Tincture, 15 to 60 ♏ (1 to 4 Cc.). Syrup, 1 to 8 ℥ (4 to 30 Cc.).

COPAL.*

Synonym.—Copal.

Botanical Name.—Comes from various trees belonging to different natural orders, chiefly Leguminosæ. *Habitat:* Africa, South America.

Part Used.—Resin, generally fossilized.

Description.—Fragments of various sizes, yellow to red brown, glossy fracture; odorless; tasteless.

Active Principles.—Resin.

Action and Uses.—Somewhat similar to but weaker than copaiba. Chiefly used in varnishes.

TRAGACANTHA.

Synonym.—Tragacanth.

Botanical Name.—As-trag'-a-lus gum'-mif-er, and other species. *Natural Order:* Leguminosæ. *Habitat:* Asia.

Part Used.—Gummy exudation.

Description.—In ribbon-shaped bands varying in size and from $\frac{1}{25}$ to $\frac{1}{8}$ in. (1 to 3 Mm.) thick, or in irregular pieces of the same, long and linear, straight or spirally twisted; externally whitish, marked by more or less pronounced longitudinal or excentric lines or ridges; translucent, horny, fracture short, tough, rendered more easily pulverizable by a heat of 50° C. (122° F.). Part dissolves and part swells in water; odorless; mucilaginous taste; powder is distinguished from powdered acacia by not dissolving so readily when tasted. Obtained by spontaneous exudation, giving the globules or cones; or by longitudinal incisions, giving the flakes or ribbons; besides these we have the long, string-like, vermiform pieces. The color is whiter the quicker it is dried, more yellow the longer it is exposed to the weather. Tragacanth is the result of transformation of cell walls of pith and medullary rays. Starch is present.

Active Principles.—Soluble gum resembling acacia; Bassorin, which is insoluble.

Action and Uses.—Similar to acacia. **Emollient,** base of many toilet creams, better than acacia. **Demulcent** for coughs, sore throat, hoarseness. Nutritive, emulsifying and suspending agent.

Preparation and Dose.—Mucilage, 1 to 8 ℥ (4 to 30 Cc.) or more.

SANTALUM RUBRUM.

Synonyms.—Red saunders, Red sandal wood, Red santal.

Botanical Name.—Pter-o-car′-pus san-ta-li′-nus. *Natural Order:* Leguminosæ. *Habitat:* East Indies.

Part Used.—Heart-wood.

Description.—Usually in chips, or a coarse, brownish-red powder; in transverse section slightly radiate, with numerous concentric rings, the medullary rays being 1 cell in width; nearly inodorous and almost tasteless. It is imported in the form of logs deprived of bark and sap-wood, but reaches the retailer as chips or raspings.

Active Principle.—Santalin (red coloring principle).

Use.—Only to give color to preparations.

Preparation.—Compound tincture of lavender.

KINO.

Synonym.—Kino.

Botanical Name.—Pter-o-car′-pus mar-su′-pi-um. *Natural Order:* Leguminosæ. *Habitat:* Asia, East Indies.

Part Used.—Inspissated juice. *Adulterants:* Catechu, inferior juices.

Description.—Small, angular, dark-red, shining pieces; brittle, in thin layers ruby red and transparent; inodorous, very astringent, and sweetish, tingeing the saliva deep red. Obtained by making incisions through the bark and catching the exudate, evaporating to an extract, and pouring into shallow pans. Generally collected in February and March, the dry season. In India, the privilege to tap trees is let out by the government.

Active Principle.—Kinotannic acid.

Action and Uses.—Similar to tannic acid. Chiefly used as an **astringent** gargle and in diarrhea mixtures, particularly good in atonic diarrhea due to use of opium.

Preparations and Doses.—Powder, 10 to 30 gr. (0.6 to 2 Gm.). Tincture, ½ to 2 ℥ (2 to 8 Cc.).

PISCIDIA.*

Synonyms.—Jamaica or White dogwood.

Botanical Name.—Ich-thy-o-me'-thi-a pis-cip'-u-la. *Natural Order:* Leguminosæ. *Habitat:* West Indies.

Part Used.—Bark of root.

Description.—Quills or curved pieces, about ⅛ in. (4 Mm.) thick, dark yellowish gray, ridged; brownish white to brown; fissured, if cork remains; inner surface brown, nearly smooth; odor suggestive of opium; bitter, acrid taste.

Active Principle.—Piscidin.

Action and Use.—Similar to opium. Causes deep sleep without unpleasant after-effects; **hypnotic** in nervous insomnia. Does not relieve pain as well as opium; hypnotic and anodyne properties somewhat unreliable. Chiefly used as nerve **sedative** and **antispasmodic** in neuralgia, coughs, toothache, dysmenorrhea. Used to stupefy fish.

Preparation and Dose.—Fluidextract, 10 to 60 ♏ (0.6 to 4 Cc.).

GLYCYRRHIZA.

Synonyms.—Licorice, Liquorice, Sweet wood.

Botanical Names.—(1) Gly-cyr-rhi'-za gla-bra. (2) G. gland-u-lif'-er-a. *Natural Order:* Leguminosæ. *Habitat:* Europe, Asia.

Parts Used.—Rhizome and root. *Adulterants:* Underground stem, identified by pith.

Description.—Spanish Licorice: Cylindrical, usually cut into pieces, 6 to 8 in. (15 to 20 Cm.) or longer, ⅕ to ⅗ in. (5 to 15 Mm.) thick, longitudinally wrinkled, grayish brown

or dark brown, pliable; fracture coarsely fibrous; internally tawny yellow; wood porous, in narrow wedges; odor slight; taste sweetish and slightly acrid.

Russian Licorice: Somewhat tapering, frequently 3 feet (1 M.) or more in length, $\frac{2}{5}$ to 2 in. (1 to 5 Cm.) in diameter, deprived of the outer, corky layer, when it is externally pale yellow; internally a lighter yellow; wood rather soft; taste less sweet than that of the Spanish licorice. Any blackened, knotty, bitter portions should be removed. Might be grown in our Southern States, as it grows in a climate where oranges grow. Fourth-year roots are the best. Annual import into the United States is about 50,000 tons. There is a discrepancy in statements as to the comparative value of Spanish and Russian licorice, the Spanish generally being preferred.

Active Principle.—Glycyrrhizin (acid ammonium glycyrrhizate).

Action and Uses.—**Demulcent** for sore throat, hoarseness, catarrh of mucous membranes of the respiratory, alimentary, and urinary tracts; **laxative**, generally with other agents, as in compound licorice powder, for constipation of children and pregnancy; **expectorant** in bronchitis and laryngitis; **flavoring** agent for bitter and disagreeable medicines; dusting and drying powder in pharmacy.

Preparations and Doses.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.). Extract and Pure extract, 10 to 30 gr. (0.6 to 2 Gm.). Compound mixture, 1 to 8 ℥ (4 to 30 Cc.). Compound powder, $\frac{1}{2}$ to 2 ℥ (2 to 8 Gm.). Troches of licorice and opium, Elixir adjuvans, Ammoniated glycyrrhizin.

ABRUS.*

Synonyms.—Jequirity, Prayer-beads, Jumble-beads, Love-peas; Indian or Wild licorice (applied to root).

Botanical Name.—A′-brus pre-ca-to′-ri-us. *Natural Order:* Leguminosæ. *Habitat:* India.

Part Used.—Seeds.

Description.—Nearly round, about the size of a small pea; hard, smooth, glossy, bright red with a black spot at hilum.

Root has a sweetish taste, due to small amount of glycyrrhizin.

Active Principle.—Abrin (albuminous matter resembling snake venom).

Action and Uses.—Infusion of seeds is used to produce irritation of the conjunctiva in trachoma and to destroy old granulations. An infusion injected into the circulation is very poisonous, being a strong cardiac depressant; applied to a mucous membrane it causes intense inflammation. The root is used as a poor substitute for licorice.

SCOPARIUS.

Synonyms.—Broom, Broom-tops, Irish or Scotch broom. *Botanical Name.*—Cyt'-i-sus sco-pa'-ri-us. *Natural Order:* Leguminosæ. *Habitat:* Europe, Asia, North America.

Part Used.—Tops.

Description.—Thin, flexible, branched twigs, externally dark green, with five wings and numerous reddish-brown cork patches, internally yellowish; younger branches somewhat pubescent; fracture short, fibrous; that of thick pieces tough and splintery; usually free from the simple, obovate leaves; having a peculiar odor when bruised; taste disagreeably bitter.

Active Principle.—Sparteine, Scoparin.

Action and Uses.—Heart: Considerable discrepancy in opinions as to the action and value of broom and sparteine on the heart; some claim it to be a **stimulant** and others a depressant; it is not cumulative. More extensively used formerly than now; used as a substitute for digitalis in chronic valvular diseases and palpitation. *Kidneys:* Broom is generally conceded to be a good **diuretic,** effect due to scoparin probably; used in cardiac dropsy and nephritis.

Preparations and Doses.—Drug, 5 to 30 gr. (0.3 to 2 Gm.), in form of infusion. Sparteine sulphate, $\frac{1}{10}$ to $\frac{1}{2}$ gr. (0.006 to 0.03 Gm.) by hypodermic injection; $\frac{1}{2}$ to 2 gr. (0.03 to 0.12 Gm.) by mouth. Scoparin, 1 to 10 gr. (0.06 to 0.6 Gm.).

BAPTISIA.*

Synonyms.—Wild, False, American, or Yellow indigo.

Botanical Name.—Bap-tis′-i-a tinc-to′-ri-a. *Natural Order:* Leguminosæ. *Habitat:* North America.

Part Used.—Root.

Description.—From 16 to 20 in. (40 to 50 Cm.) long, knotty crown, branched, bent, warty, tough, fibrous, thick bark covering whitish wood, dark brown; slight odor; bitter, acrid taste.

Active Principles.—Baptitoxine, Baptisin, Baptin.

Action and Uses.—**Antiseptic** for painful ulcers, gangrene, stomatitis, in typhoid fever, variola, epidemic dysentery; **laxative** in small doses and emetic and cathartic in large doses; nervous stimulant; antipyretic.

Preparation and Dose.—Fluidextract, 2 to 20 ♏ (0.13 to 1.3 Cc.).

ARAROBA.*

Synonym.—Goa powder.

Botanical Name.—Vou-a-ca-pou′-a ar-a-ro′-ba. *Natural Order:* Leguminosæ. *Habitat:* South America.

Part Used.—A powder obtained from clefts in trees.

Description.—Powder of different degrees of fineness; bitter; yellow when fresh, getting brown or purplish on exposure; resembles decayed wood; it is the result of chemical change of cell walls. Obtained by cutting down old trees, splitting open and scraping the powder from cavities. Chrysarobin is not identical with chrysophanic acid, but can be converted into it.

Active Principles.—Chrysarobin (U. S. P.), Chrysophanic acid.

Action and Uses.—Chrysarobin is preferred to araroba and is used chiefly externally as stimulating **irritant** and **parasiticide** in ringworm, acne, favus, eczema, psoriasis, lichen, and chronic skin diseases. Applied too strong it may produce inflammation and boils. Should not be used on the face for fear of its getting into the eyes; it stains the skin and

clothing; stain can be removed from skin by solution of chlorinated lime. It may be absorbed and cause systemic effect. Internally it is a gastro-intestinal irritant, causing vomiting and watery stools.

Preparation and Dose.—Chrysarobin, $\frac{1}{8}$ to 1 gr. (0.008 to 0.06 Gm.). Ointment.

PHYSOSTIGMA.

Synonyms.—Calabar bean, Ordeal bean, Chop nut.

Botanical Name.—Phy-so-stig′-ma ven-e-no′-sum. *Natural Order:* Leguminosæ. *Habitat:* Africa.

Part Used.—Seed.

Description.—Oblong, somewhat reniform, $\frac{3}{5}$ to $\frac{6}{5}$ in. (15 to 30 Mm.) long, $\frac{2}{5}$ to $\frac{3}{5}$ in. (10 to 15 Mm.) thick; externally reddish or chocolate brown, smooth, somewhat roughened near the brownish-black groove which extends almost the entire length of the convex edge; its reddish, rounded margins elevated and somewhat thickened; embryo whitish, with a short, curved hypocotyl and two large, concavoconvex cotyledons; having a bean-like and heavy odor when crushed; taste at first starchy, afterward acrid. Gets the name ordeal bean from the fact that it is used by the natives in trying persons for witchcraft; they are made to eat the bean until they vomit or die; if they live they are innocent; if they die they are guilty.

Active Principles.—Physostigmine (eserine), Eseridine. The U. S. P. requires not less than 0.15 per cent. of ether-soluble alkaloids.

Action and Uses.—Alimentary canal: Increases saliva at first, but this may be checked by contraction of bloodvessels. Stimulates peristalsis and is given with tonics in constipation due to torpor. *Nervous system:* Reflex excitability is diminished; used as an **antispasmodic** for locomotor ataxia, writers' cramp, tetanus, strychnine poisoning, paralysis. *Circulation:* Heart is slowed by action of drug on cardiac muscle and on the vagus; blood pressure is raised, due to contraction of vessels. *Respiration:* At first quickened, then retarded.

Eye: Contracts the pupil by stimulating the motor nerve endings in the sphincter; causes spasm of accommodation; diminishes intraocular tension. Used as a **myotic** to break up adhesions in iritis, to diminish tension, to prevent prolapse of iris, to shut out light in photophobia, in glaucoma. Usual strength solution for the eye is 1 or 2 grains to 1 ounce of water. *Secretions:* Practically all secretions of glands are increased by stimulating the nerve terminations in the cells; sialagogue, diaphoretic, diuretic, expectorant. *Unstriped muscles:* Generally stimulated; used in chronic bronchitis where there is deficient power of expectoration, bronchial asthma, atony of bladder and of intestines. *Toxicology:* Vomiting, purging, dyspnea, vertigo, weakness, muscular twitchings, collapse, death by paralysis of respiration, consciousness to near the end. In treating, empty the stomach, give atropine ($\frac{1}{30}$ gr. by injection), stimulants, strychnine, alcohol, digitalis, warmth, artificial respiration.

Preparations and Doses.—Extract, $\frac{1}{16}$ to $\frac{1}{2}$ gr. (0.004 to 0.03 Gm.). Tincture, 5 to 20 ♏ (0.3 to 1.3 Cc.). Physostigmine sulphate or salicylate, $\frac{1}{120}$ to $\frac{1}{20}$ gr. (0.0005 to 0.003 Gm.).

KRAMERIA.

Synonyms.—Rhatany. (1) Peruvian or Red rhatany. (2) Savanilla or Violet rhatany. (3) Brazilian, Para or Brown rhatany.

Botanical Names.—(1) Kra-me′-ri-a tri-an′-dra. (2) K. ix-i′-na. (3) K. ar-gen′-te-a. *Natural Order:* Krameriaceæ. *Habitat:* South America.

Part Used.—Root.

Description.—Peruvian Krameria: Root branches, several or many, usually attached to a short, hard, and woody taproot, which is $\frac{3}{5}$ to $1\frac{1}{2}$ in. (1.5 to 4 Cm.) thick, roughly fissured, and supporting a knotty, several to many-headed crown; roots cylindrical, flexuous or wavy, very flexible; externally light red brown, more or less marked with dark, scaly patches, especially upward; otherwise smoothish, devoid of transverse fissures; fracture tough and splintery, the pinkish-brown

bark occupying less than one-third of the radius; the wood yellowish or pinkish white, finely radiate; inodorous, and of a very astringent taste.

Savanilla and Brazilian Krameras: Branches usually occurring detached from the tap-root and crown, less flexuous than those last described; externally of a purple brown or chocolate brown, and with numerous transverse cracks or fissures; fracture less tough than that of Peruvian krameria, the bark and wood both darker, the bark occupying two-fifths or more of the radius; the taste more astringent than that of Peruvian krameria. Thick-barked root is best, as the tannin is largely in the bark.

Active Principle.—Kramerotannic acid.

Action and Uses.—Similar to tannic acid.

Preparations and Doses.—Fluidextract, 5 to 30 ♏ (0.3 to 2 Cc.). Extract, 5 to 15 gr. (0.3 to 1 Gm.). Tincture and Syrup, ½ to 2 ℥ (2 to 8 Cc.). Troches.

GERANIUM.

Synonyms.—Cranesbill, Spotted or Wild cranesbill, Alum-root.

Botanical Name.—Ge-ra′-ni-um mac-u-la′-tum. *Natural Order:* Geraniaceæ. *Habitat:* North America.

Part Used.—Rhizome. *Adulterants:* Tormentil, bistort.

Description.—Of horizontal growth, cylindraceous, somewhat flattened and rather sharply tuberculated, 1 to 4 in. (2.5 to 10 Cm.) long, and ⅛ to ⅜ in. (3 to 15 Mm.) in diameter; longitudinally wrinkled, dark brown; fracture short, light reddish brown or purplish; bark thin, wood indistinct, central pith large; odor slight, taste strongly astringent.

Active Principle.—Tannic acid.

Action and Uses.—Similar to tannic acid. On account of absence of disagreeable taste and irritating effects it is particularly good for infants and persons with weak stomachs; good in serous diarrhea; popular domestic astringent. Infusion is used as mouth-wash and gargle in relaxed mucous membrane.

Preparation and Dose.—Fluidextract ½ to 1 ℥ (2 to 4 Cc).

LINUM.

Synonyms.—Linseed, Flaxseed.

Botanical Name.—Li′-num u-si-ta-tis′-si-mum. *Natural Order:* Linaceæ. *Habitat:* Asia, Europe, cultivated.

Part Used.—Seed, Fixed oil from seed. *Adulterants:* Of seed; other seeds, mineral matter, cake from which oil has been pressed, damaged flour, cornmeal. Of oil; non-drying oils, mineral oils, rosin oil, rosin.

Description.—Ovate or oblong lanceolate, flattened, about $\frac{1}{5}$ in. (5 Mm.) long, obliquely pointed at one end; externally chestnut brown, very smooth and glossy, covered with a transparent, mucilaginous outer wall which swells in water; embryo whitish or greenish, with two large, planoconvex, and oily cotyledons, embedded in a thin perisperm; odor slight; taste mucilaginous, oily.

Ground linseed (linseed meal or flaxseed meal) should be recently prepared and free from unpleasant or rancid odor. It is a grayish-yellow powder containing brownish fragments, and should not contain more than a trace of starch. Raw oil alone should be used in pharmacy.

Active Principles.—Fixed oil, Mucilage.

Action and Uses.—**Emollient,** in form of poultice to apply heat and moisture to an inflamed surface, enlarged gland, or boil; it relaxes tissues, dilates local bloodvessels, tends to check inflammation; laudanum or other medicinal agents may be smeared over the surface before applying. Best to put into a bag, then dip this into hot water; may smear surface with olive oil to keep poultice from drying on the surface; has given way largely to more aseptic agents. **Demulcent** in the form of an infusion for tickling in the throat, coryza, bronchitis, enteritis, dysentery, cystitis, strangury. The seed may be used as laxative. The oil with lime-water is used for burns; oil given by enema is laxative.

Dose.—Oil, $\frac{1}{2}$ to 2 ℥ (15 to 60 Cc.).

COCA.

Synonyms.—Coca. (1) Huanuco coca. (2) Truxillo coca.
Botanical Names.—(1) Er-y-throx'-y-lon co'-ca. (2) E. tru-xil-len'-se. *Natural Order:* Erythroxylaceæ. *Habitat:* South America, cultivated.

Part Used.—Leaves. *Adulterants:* Foreign leaves.

Description.—Huanuco Coca: Greenish brown to clear brown, smooth, and slightly glossy, thickish and slightly coriaceous, stoutly and very shortly petioled; blade 1 to 3 in. (2.5 to 7.5 Cm.) long, and nearly elliptical, with a very short and abruptly narrowed basal portion and a short point, the margin entire; midrib marked above by a slight ridge, very prominent underneath, the remaining venation rather obscure, especially above; underneath, a conspicuous line of collenchyma tissue runs longitudinally on either side of the midrib and about one-third of the distance between it and the margin, the enclosed areola being of a slightly different color from the adjacent surface; odor characteristic; taste bitterish, faintly aromatic, followed by a numbness of the tongue, lips, and fauces.

Truxillo Coca: Pale green, thin, brittle, and usually much broken; smooth, but not shining; shortly and stoutly petioled; blade $\frac{3}{5}$ to 2 in. (1.5 to 5 Cm.) long and one-third to one-half as broad, obovate to oblanceolate, narrowed from near the middle into the petiole, usually with a slightly projecting point at the summit, the margin entire; underneath two irregular lines of collenchyma tissue, usually incomplete or obscure, and frequently wanting, run beside the midrib at about one-third the distance from it to the margin; odor more tea-like than that of Huanuco coca; taste and numbing effect similar.

Largely cultivated in the Andes, the cultivated being better than the wild; several harvests are made during the year. The leaves are collected when full grown, bright green above and yellow green below, dried in the sun, put into heaps for a few days and again dried, then baled. They begin to deteriorate as soon as dried; after a few months have lost considerable cocaine, and are regarded as unfit for use in less than a year.

Crude cocaine is largely extracted in South America. While the Huanuco contains more cocaine the Truxillo is generally preferred by the natives.

Active Principles.—Cocaine, Ecgonine, and several other compounds. U. S. P. requires not less than 5 per cent. of ether-soluble alkaloids.

Action and Uses.—The effect upon people of North America and Europe is quite different from that upon the natives, who chew the leaves (generally mixed with a little ashes or lime) from childhood up. They may use as much as a half ounce a day and yet the cocaine habit, as we know it, is practically unknown among them. *External:* Cocaine probably has no effect on unbroken skin. Applied to mucous membrane or abraded surface or injected subcutaneously it produces local **anesthesia**, by paralysis of sensory nerves; causes contraction and subsequent dilatation of cutaneous vessels; 1 to 4 per cent. solutions are used for the eye, 4 to 10 per cent. solutions for most other mucous membranes or for injection previous to operations. It is applied to relieve pain and discomfort in cases of ulcers, fissures, boils, hemorrhoids, pruritus and itching skin diseases, poison ivy, eruption, hay fever, asthma, catarrh. Very useful in minor surgical operations particularly upon the eye, nose, ear, and throat; used in making examinations of the throat or passing the catheter. *Alimentary canal:* Small doses act as a bitter tonic, improving digestion; used in wasting diseases, convalescence, low fevers, mental or physical strain; larger doses have a **sedative** effect on gastric mucous membrane, lessening hunger and irritation; it is not a food, though it lessens tissue waste. Used to relieve vomiting of seasickness and pregnancy. *Nervous system:* Stimulates brain and mental faculties; increases physical power and decreases fatigue; practically no general anesthetic effect when given by the mouth unless in toxic doses; large doses cause depression. Used in neurasthenia, melancholia, cerebral and spinal anemia. *Circulation:* Primary slowing, then stimulation of the heart force is increased; blood pressure is raised, due to the contraction of the arterioles. *Respiration:* Stimulated by action on centre in the medulla; large doses depress. *Eye:* Applied locally or given internally the pupil

is dilated, due to stimulation of the sympathetic nerve; accommodation is impaired, corneal epithelium is desiccated. *Excretion:* Chiefly in urine and feces; urine is generally increased, but urea decreased. *Antidote:* Said to be a complete antagonist to morphine and chloral hydrate. *Susceptibility:* Persons vary, commencing dose should be small and antidotes should be at hand.

Toxicology.—Unconsciousness and serious symptoms have resulted from $\frac{1}{8}$ of a grain of the alkaloid; $1\frac{3}{4}$ grains have killed a man. Toxic symptoms follow the injection into the urethra more frequently than from any other use. Patient is excited and restless, has dryness of throat, headache, vertigo; pulse quick and forcible becomes small, rapid, intermittent; respiration quick, then slow and shallow; pupils dilated, delirium, tremors, and sometimes convulsions; skin cold, clammy, cyanotic; sense of impending dissolution; death usually from paralysis of respiration. Treatment consists in emptying the stomach by washing or by apomorphine hydrochloride; give stimulants, as strong coffee, alcohol, ether, strychnine, amyl nitrite if blood pressure is high, chloroform for convulsions, artificial respiration. *Chronic poisoning:* Symptoms are indigestion, nausea, emaciation, insomnia, loss of intellect; hallucinations, as scraping the tongue to remove blackworms, formication, extreme selfishness, disregard of all duties; under the influence of the drug the person is practically insane. Often taken by hypodermic injection and effect soon passes off, requiring another dose; body becomes covered with scars and sores. Habit is probably quicker and worse than that of morphine. Habitués of morphine go to cocaine, and *vice versa*, with the hope of relief, but generally resulting in increased doses of both. The case is difficult to cure permanently; withdraw drug quickly, but not too suddenly; patient must be confined and watched for a considerable time.

Preparations and Doses.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.). Wine, 1 to 8 ℥ (4 to 30 Cc.). Cocaine and Cocaine hydrochloride, $\frac{1}{8}$ to $\frac{1}{2}$ gr. (0.008 to 0.03 Gm.) by hypodermic injection; $\frac{1}{8}$ to 1 gr. (0.008 to 0.06 Gm.) by mouth. Oleate.

Eucaine Hydrochloride A.—A synthetic product, occurs in glossy scales, or plates. Applied locally or by injection it acts like cocaine, but does not contract vessels, does not paralyze accommodation, does not produce mydriasis, is more irritating, is slower, and less toxic. Used in the same strength solution as cocaine. Eucaine Hydrochloride B is similar to A except that it is less irritating, and causes less hyperemia. Dose same as cocaine. Holocaine Hydrochloride occurs in colorless, crystalline powder, slightly bitter. Used as a substitute for cocaine in ophthalmic practice; does not dilate pupil; said to be five times more toxic than cocaine; 1 per cent. solution generally used.

GUAIACUM.

Synonyms.—Guaiac, Resin of guaiac. Of tree, Lignum vitæ.

Botanical Names.—(1) Guai'-a-cum of-fi-ci-na'-le. (2) G. sanc'-tum. *Natural Order:* Zygophyllaceæ. *Habitat:* West Indies, South America.

Part Used.—Resin of wood. *Adulterants:* Other resins, bark.

Description.—Usually in irregular masses; externally greenish gray brown; brittle, the fracture having a glassy lustre, in recent guaiac yellowish green or reddish brown; transparent in thin splinters; fusible; odor balsamic; taste slightly acrid. The powder is grayish, turning green on exposure to air. Obtained partly as a natural exudation, partly by heating wood.

Wood (U. S. P. 1890) heavier than water, hard, brown or greenish brown, usually in the form of raspings or turnings, without many whitish pieces; odor slight, but balsamic on heating; taste acrid.

Active Principles.—Of resin, Guaiaretic, Guaiaconic, and Guaiacic acids.

Action and Uses.—Used as an **alterative** in rheumatism, gout, and syphilis; **expectorant** in tonsillitis, sore throat; **emmenagogue** in neuralgic dysmenorrhea, amenorrhea; siala-

gogue, diaphoretic, laxative, cholagogue, antiseptic, gastro-intestinal irritant.

Preparations and Doses.—Tincture and Ammoniated tincture, 10 to 60 ♏ (0.6 to 4 Cc.). Resin, 10 to 30 gr. (0.6 to 2 Gm.).

XANTHOXYLUM.

Synonyms.—Prickly ash, Toothache bark, Pepper wood. (1) Northern prickly ash, Angelica tree. (2) Southern prickly ash, Hercules' club.

Botanical Names.—(1) Xan-thox'-y-lum a-mer-i-ca'-num. (2) Fa-ga'-ra cla'-va-her'-cu-lis. *Natural Order:* Rutaceæ. *Habitat:* North America.

Part Used.—Bark. *Adulterant:* Aralia spinosa (nearly smooth, beset with slender prickles).

Description.—Northern Prickly Ash: In curved or quilled fragments, about $\frac{1}{25}$ in. (1 Mm.) thick; outer surface brownish gray, with whitish patches, and minute, black dots, faintly furrowed, with some brown, glossy, straight, two-edged spines, linear at the base, and about $\frac{1}{5}$ in. (5 Mm.) long; inner surface whitish, smooth; fracture short, non-fibrous, green in the outer and yellowish in the inner layer; inodorous; taste bitterish, very pungent.

Southern Prickly Ash: In very large quills or sheets, externally of a light purplish gray, with large, silvery-gray patches, and marked by many large, corky projections, frequently $\frac{4}{5}$ in. (2 Cm.) high, which often bear stout, brown spines; otherwise like the northern prickly ash.

Prickly ash berries* are used like the bark. Brownish capsules, bivalved, oval, dotted externally, whitish yellow and smooth inside, northern bearing a short stalk; containing an oval, black, wrinkled seed, which is hollow when dry; odorless; aromatic, pungent taste. Constituents similar to those in the bark.

Active Principles.—Resins, Volatile oil, Bitter principle.

Action and Uses.—Quite similar to guaiac. **Counter-irritant** in toothache and myalgia, causing tingling; **alterative** in syphilis and rheumatism; **cholagogue** in catarrh of bile

ducts; increases secretions of stomach, intestines, liver; aromatic tonic, sialagogue, expectorant, diuretic, emmenagogue.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

CUSPARIA.*

Synonyms.—Angustura, Angostura.

Botanical Name.—Cus-pa′-ri-a an-gus-tu′-ra. *Natural Order:* Rutaceæ. *Habitat:* South America.

Part Used.—Bark. *Adulterant:* Brazilian angustura.

Description.—Flat or curved pieces, 2 to 8 in. (5 to 20 Cm.) long, 1 to 4 in. (2.5 to 10 Cm.) broad; dirty gray outside, sometimes corky warts; inside brown, often with wavy, transverse lines; shining crystals of calcium oxalate; odor aromatic; taste bitter, aromatic.

Active Principles.—Angusturin, Cusparine, Galipine.

Action and Uses.—Simple aromatic bitter; used in atonic dyspepsia and convalescence from acute fever. Slight antiperiodic.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

PILOCARPUS.

Synonym.—Jaborandi.

Botanical Names.—Pi-lo-car′-pus jab-o-ran′-di. P. micro-phyl′-lus. *Natural Order:* Rutaceæ. *Habitat:* South America.

Part Used.—Leaflets. *Adulterants:* Leaves from other species and plants; very often adulterated or substituted.

Description.—PILOCARPUS JABORANDI: Very shortly and stoutly petioluled, the blades $2\frac{2}{5}$ to $4\frac{4}{5}$ in. (6 to 12 Cm.) long, and $\frac{1}{3}$ as broad, oblong or oval, mostly unequal at the base; blunt and emarginate at the summit, the margin entire and narrowly revolute; yellowish green, very smooth, shining, thick, and coriaceous, the reticulate venation prominent on both sides, especially beneath; strongly pellucid glandular;

peculiarly aromatic when crushed; taste bitter, aromatic, later somewhat pungent.

PILOCARPUS MICROPHYLLUS: Leaflets $\frac{1}{2}$ to $1\frac{1}{2}$ in. (1.2 to 3.7 Cm.) long, $\frac{1}{3}$ to $\frac{2}{3}$ in. (0.8 to 1.6 Cm.) broad; the lateral without petiolules, rhomboidally oval to obovate, acute at the base, blunt and unequally emarginate at the summit; the terminal on short, margined petiolules, almost equally oval to obovate, rather narrower than the lateral; all thickish and rigid, with entire margin smooth and dull green, finely pellucid glandular; midrib stout, the veins rather coarsely reticulate, lightly prominent; almost odorless; taste similar to that of Pilocarpus jaborandi.

Active Principles.—Pilocarpine, Pilocarpidine. U. S. P. requires not less than 0.5 per cent. alkaloids.

Action and Uses.—Applied externally or taken internally it increases growth of **hair**, making it darker and coarser. *Alimentary canal:* Saliva may be increased to a pint or more from a single dose. Minute doses may check ptyalism. Gastric and pancreatic secretions are increased; nausea and vomiting sometimes occur; peristalsis is increased. *Nervous system:* The main action of pilocarpine is to **stimulate nerve terminations** in glands and involuntary muscles; this explains the increase of secretions and peristalsis, the contraction of vessels, bladder, and uterus. *Circulation:* Is accelerated, blood pressure is raised; large doses weaken the heart and lower the pressure; should be given carefully in heart troubles. *Respiration:* Quickened and mucus in the bronchi is increased; used in hiccough and spasmodic asthma. *Eye:* Pupil is contracted, due to stimulation of nerves of the motor oculi; accommodation is impaired; interocular tension is diminished. Used to relieve pain from overuse, in chronic iritis, keratitis, hemorrhage of retina, glaucoma, amblyopia from alcohol or tobacco. *Kidneys:* Urine is generally decreased if sweat is increased; desire to urinate is due to contraction of the bladder. *Uterus:* Contracted and abortion may result. *Skin:* The most efficient **diaphoretic,** increasing elimination of solids as well as water; cutaneous vessels sometimes dilated; sweat may amount to a pint or more. Used in Bright's disease, diabetes insipidus, and dropsy from other

causes, to relieve the kidneys and lower blood pressure; used in erysipelas and scaly skin diseases; **sorbefacient** to reduce inflammatory products in mumps and similar diseases. *Temperature:* Primarily raised, then lowered with the diaphoresis. *Secretions:* Tears, mucus, cerumen, and other secretions increased; milk is sometimes increased. *Antidote:* To atropine in nearly every particular. Children bear it well.

Preparations and Doses.—Fluidextract, 10 to 45 ♏ (0.6 to 3 Cc.). Pilocarpine hydrochloride and nitrate, $\frac{1}{8}$ to $\frac{1}{2}$ gr. (0.008 to 0.03 Gm.).

BUCHU.

Synonyms.—Buchu, Short buchu.

Botanical Name.—Ba-ros′-ma bet-u-li′-na. *Natural Order:* Rutaceæ. *Habitat:* Africa.

Part Used.—Leaves. *Adulterants:* Long buchu; leaves, branches, and twigs of allied species.

Description.—About $\frac{3}{5}$ in. (15 Mm.) long, varying between oval and obovate, yellowish green, apex obtuse; margin crenate or serrate, with a gland at the base of each tooth, the base more or less wedge-shaped; coriaceous, both surfaces beset with numerous slight projections; odor strong and characteristic; taste somewhat mint-like, pungent, and bitterish.

Barosma crenulata (U. S. P. 1890) is also a short buchu, relatively smaller, narrower, and more oval. Barosma serratifolia, long buchu, once official, $1\frac{1}{5}$ to $1\frac{3}{5}$ in. (3 to 4 Cm.) long, narrow, thin, tapering at both ends, contains less active matter.

Active Principles.—Oil, Resin, Barosmin.

Action and Uses.—Stomachic in atonic dyspepsia; **expectorant** in bronchitis; slight **diuretic**, the urine being made darker and aromatic; antiseptic and **disinfectant** to genito-urinary tract and used chiefly in chronic diseases, as pyelitis, cystitis, urethritis, prostatitis. Large doses cause burning, nausea, vomiting, purging, strangury.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

RUTA.*

Synonym.—Rue.

Botanical Name.—Ru′-ta gra-ve′-o-lens. *Natural Order:* Rutaceæ. *Habitat:* Europe, cultivated.

Part Used.—Leaves.

Description.—Lower leaves 2- and 3-pinnately divided; leaflets sessile, oblong, obtuse, dotted, smooth, gray to yellow brown; odor heavy, disagreeable; taste bitter and acrid. Drying impairs activity.

Active Principles.—Volatile oil, Rutin.

Action and Uses.—Active irritant applied locally, or in alimentary canal, or in genito-urinary tract. **Emmenagogue** in amenorrhea, menorrhagia, metrorrhagia, functional inactivity; **abortifacient,** but uncertain and often proves fatal; resembles savine; **antispasmodic** in hysteria and convulsions. Rarely given as a medicine.

Doses.—15 to 30 gr. (1 to 2 Gm.). Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.).

PTELEA.*

Synonyms.—Wafer ash, Hop-tree, Shrubby trefoil, Wingseed.

Botanical Name.—Pte′-le-a tri-fo-li-a′-ta. *Natural Order:* Rutaceæ. *Habitat:* North America.

Part Used.—Bark of root.

Description.—Quills or irregular fragments, longitudinally wrinkled, brown, lighter and smoother inside; slight odor; bitter, pungent taste.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Promotes appetite, **tonic** after intermittent and remittent fevers, antiperiodic.

Dose.—15 to 30 gr. (1 to 2 Gm.).

AURANTII AMARI CORTEX.

Synonyms.—Bitter, Wild, Curaçao, Seville, or Bigarada orange-peel.

Botanical Name.—Cit'-rus vul-ga'-ris. *Natural Order:* Rutaceæ. *Habitat:* Asia, Europe, North America, cultivated.

Part Used.—Dried rind of unripe fruit. *Adulterant:* Peel of sweet orange.

Description.—In narrow, thin bands, or in quarters; epidermis of a brownish-green color; outer layer with numerous oil reservoirs; inner layer spongy, light yellowish brown; odor fragrant; taste aromatic and bitter. The flowers are used for the production of oil of orange-flowers, which is used in perfumery and is quite different from that of the peel.

Active Principles.—Volatile oil, Naringin.

Action and Uses.—Aromatic bitter stomachic and carminative; generally given with bitter tonics in indigestion and flatulence.

Preparations and Doses.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.); Tincture, 1 to 2 ℥ (4 to 8 Cc.); Orange-flower water, Stronger orange-flower water, Syrup orange-flowers.

AURANTII DULCIS CORTEX.

Synonym.—Sweet orange-peel.

Botanical Name.—Cit'-rus au-ran'-ti-um. *Natural Order:* Rutaceæ. *Habitat:* Asia, Europe, North America, cultivated.

Part Used.—Fresh outer rind of ripe fruit.

Description.—Outer surface orange yellow, with numerous oil reservoirs; odor highly fragrant; taste pungently aromatic. Frequently the dried peel is used and it differs from the bitter in color and taste. The volatile oil obtained by distillation soon acquires a disagreeable, terebinthinate odor on exposure; best protected by keeping in amber-colored bottles in a cool place, with the addition of about 5 per cent. of alcohol; almost identical with oil from bitter orange, but not so bitter.

Active Principle.—Volatile oil.

Use.—Flavoring agent.

Preparations and Doses.—Tincture, 1 to 2 ℥ (4 to 8 Cc.). Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.). Syrup, Compound spirit.

1. LIMONIS CORTEX. 2. LIMONIS SUCCUS.

Synonyms.—(1) Lemon-peel. (2) Lemon-juice.

Botanical Name.—Cit'-rus li-mo'-num. *Natural Order:* Rutaceæ. *Habitat:* Asia, Europe, North America, cultivated.

Parts Used.—Fresh outer rind of ripe fruit, Juice.

Description.—PEEL: Narrow bands or curved sections, lemon yellow outside; tissue containing large oil cells; fragrant aromatic odor and taste. Inner white part of peel should be removed, as it is bitter and contains a principle that gives a dark color with iron. JUICE: Slightly turbid, yellowish; odor of lemon; acid taste.

Active Principles.—Of peel, Volatile oil; of Juice, Citric acid.

Action and Uses.—Peel and oil are used as **flavoring agents.** The juice is a refrigerant in fevers; prophylactic and **specific** in scurvy; has been used in rheumatism.

Preparations and Doses.—Tincture, ½ to 2 ℥ (2 to 8 Cc.). Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.). Juice, ½ to 4 ℥ (15 to 120 Cc.). Citric acid, 5 to 15 gr. (0.3 to 1 Gm.). Syrup of citric acid.

QUASSIA.

Synonyms.—Quassia, Bitter ash, Bitter wood. (1) Jamaica quassia. (2) Surinam quassia.

Botanical Names.—(1) Pic-ras'-ma ex-cel'-sa. (2) Quas'-si-a a-ma'-ra. *Natural Order:* Simarubaceæ. *Habitat:* West Indies, South America.

Part Used.—Wood.

Description.—JAMAICA QUASSIA: Occurring in various forms, usually in chips, raspings, or billets; yellowish white or pale yellow, and of rather coarse texture; odor slight;

taste intensely bitter; medullary rays containing tetragonal prisms or small, arrow-shaped crystals of calcium oxalate. Billets are usually 5 in. (12.5 Cm.) or more in diameter.

SURINAM QUASSIA: Occurring usually in billets not exceeding 3 in. (7.5 Cm.) in diameter; the wood is heavier, harder, and more deeply colored than that of Jamaica quassia.

Active Principle.—Picrasmin (quassin), no tannin.

Action and Uses.—Similar to calumba. May be given with iron, as it contains no tannin. Bitter **stomachic** in atonic dyspepsia, regurgitation of food, dyspepsia of drunkards, convalescence; intensely bitter and may cause in some persons a burning throat, headache, nausea, vomiting, purging, vertigo; water allowed to stand in quassia cups becomes bitter and is used by the laity. Feeble **antiperiodic**. An infusion used by rectal injection is **anthelmintic** against thread-worms. Poison to flies and fish.

Preparations and Doses.—Extract, 1 to 3 gr. (0.06 to 0.18 Gm.). Fluidextract, 5 to 30 ♏ (0.3 to 2 Cc.). Tincture, 15 to 60 ♏ (1 to 4 Cc.).

SIMARUBA.*

Synonym.—Simaruba bark.

Botanical Name.—Si-ma-ru′-ba a-ma′-ra. *Natural Order:* Simarubaceæ. *Habitat:* South America.

Part Used.—Bark of root.

Description.—Curved or quilled pieces, 2 to 4 in. (5 to 10 Cm.) long, $\frac{1}{8}$ in. (3 Mm.) thick; pale yellow to brown outside; light brown inside, generally deprived of outer, corky part; tough, flexible; odorless, very bitter.

Active Principle.—Picrasmin (probably).

Action and Uses.—Similar to quassia.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

AZEDARACH.*

Synonyms.—China tree, Pride of China, Bead-tree, Indian lilac.

Botanical Name.—Me′-li-a a-zed′-a-rach. *Natural Order:* Meliaceæ. *Habitat:* Asia, naturalized in United States.

Part Used.—Bark of root.

Description.—Irregular curved pieces or quills, reddish brown externally, with blackish, longitudinal ridges; light brown internally, with ridges; odorless; sweet, then bitter and nauseous taste.

Active Principle.—Resin.

Action and Uses.—Given in decoction as **anthelmintic** for round-worms. Entire plant has some tonic and antiperiodic effects. Large doses cause symptoms resembling those of belladonna.

Dose.—15 to 60 gr. (1 to 4 Gm.).

COCILLANA.*

Synonym.—Cocillana.

Botanical Name.—Sy-co-car'-pus rus'-by-i. *Natural Order:* Meliaceæ. *Habitat:* South America.

Part Used.—Bark.

Description.—Deeply fissured, ashy gray outside, yellowish brown inside; slight odor; nauseous taste.

Active Principle.—Rusbyine.

Action and Uses.—Similar to ipecac, but less likely to nauseate; recommended as an expectorant.

Dose.—5 to 15 gr. (0.3 to 1 Gm.).

MYRRHA.

Synonym.—Myrrh.

Botanical Name.—Com-miph'-o-ra myr'-rha. *Natural Order:* Burseraceæ. *Habitat:* Africa.

Part Used.—Gum resin. *Adulterants:* Bdellium, Bisabol myrrh, Arabian myrrh, other gum resins.

Description.—In roundish or irregular tears or masses, dusty, brownish yellow or reddish brown; fracture waxy, somewhat splintery, translucent on the edges, sometimes with whitish veins; odor balsamic; taste aromatic, bitter, and acrid. Obtained by exudation through natural or made

fissures. Yellowish white and soft at first, getting darker and harder. Arabian myrrh resembles the official, but is of poorer quality.

Active Principles.—Volatile oil, Resin.

Action and Uses.—External: Irritant, **stimulant,** and **disinfectant**; used in unhealthy sores, eczema, ulcerated gums, relaxed throat. *Alimentary canal:* Tonic, **carminative,** irritant in large doses; given in gastralgia and to relieve griping of purgatives. *Elimination:* Through mucous membranes, **disinfecting** and generally checking morbid secretions; **expectorant,** especially good for chronic bronchitis; emmenagogue in amenorrhea with anemia. Antispasmodic in hysteria; cardiac stimulant; ingredient in tooth-powders.

Preparation and Dose.—Tincture, 10 to 30 ♏ (0.6 to 2 Cc.).

OLIBANUM.*

Synonym.—Frankincense.

Botanical Name.—Bos-wel′-li-a car-te′-ri-i and other species. *Natural Order:* Burseraceæ. *Habitat:* Africa.

Part Used.—Gum resin.

Description.—Oblong or roundish tears, about ½ in. in diameter, yellow brown, coated with whitish powder, thin fragments transparent; balsamic odor and taste.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Stimulant and expectorant, chiefly in making plasters.

Dose.—15 to 30 gr. (1 to 2 Gm.).

SENEGA.

Synonyms.—Senega or Seneca snakeroot, Rattlesnake root, Mountain flax.

Botanical Name.—Po-lyg′-a-la sen′-e-ga. *Natural Order:* Polygalaceæ. *Habitat:* North America.

Part Used.—Root. *Adulterants:* Triosteum, cypripedium, other species.

Description.—Somewhat cylindrical, tapering, more or less flexuous, $1\frac{1}{5}$ to 6 in. (3 to 15 Cm.) long, and $\frac{1}{12}$ to $\frac{1}{3}$ in. (2 to 8 Mm.) thick, bearing several similar, horizontal branches and a few rootlets; crown knotty with numerous buds and short stem remnants; externally yellowish gray or brownish yellow, longitudinally wrinkled, usually marked by a keel which is more prominent in perfectly dry roots near the crown; fracture short, wood light yellow, usually excentrically developed; odor slight, nauseating; taste sweetish, afterward acrid. Southern senega is smaller and paler than northern.

Active Principles.—Senegin, no tannin or starch, but sometimes a little methyl salicylate.

Action and Uses.—External: Irritant, inhaled causes sneezing and increased secretion. *Internal:* Increases saliva and gastric juice; large doses cause nausea, vomiting, purging, depression of heart, convulsions, paralysis. *Elimination:* Through mucous membrane of respiratory and genito-urinary tracts and skin, irritating and stimulating them; chiefly used as **expectorant** in subacute and chronic bronchitis, increasing secretion and aiding its expulsion; **diuretic,** not great or certain, in dropsies of renal origin.

Preparations and Doses.—Fluidextract, 10 to 30 ♏ (0.6 to 2 Cc.). Syrup, $\frac{1}{2}$ to 2 ℥ (2 to 8 Cc.). Compound syrup of squills, 5 to 60 ♏ (0.3 to 4 Cc.).

ELASTICA.

Synonyms.—Rubber, Para or India rubber, Caoutchouc.

Botanical Name.—Several species of Hevea. *Natural Order:* Euphorbiaceæ. *Habitat:* South America.

Part Used.—Prepared milk juice. *Adulterants:* Juice from allied trees, sand, mineral matter.

Description.—In flask-shaped or roundish masses, or in pieces of the same, having sharply incised surfaces and exhibiting a laminated structure; floats on water; externally brownish to brownish black; internally of a lighter tint, mottled; odor creosote-like; nearly tasteless. Heat to about 125° C. melts it and it remains soft for some time. Obtained

by puncturing the bark, being careful not to pierce to the wood as an insect is liable to enter and kill the tree. The milky exudation is caught in cups and a paddle dipped into it, then held in smoke, which coagulates it. When first coagulated it is nearly white, but gets darker from without in.

Active Principle.—Caoutchouc.

Uses.—Making plasters, trusses, braces, catheters, pessaries, shields, sheeting, bandages, bougies, etc.

CROTON TIGLIUM.*

Synonyms.—Croton-oil plant, Croton seed, Purging croton. *Botanical Name.*—Cro′-ton tig′-li-um. *Natural Order:* Euphorbiaceæ. *Habitat:* East Indies, Asia.

Part Used.—Seeds, for the production of oil.

Description.—About ½ in. (12 Mm.) long, ovoid, shaped like castor bean, thin testa; not smooth and shiny; brittle; mottled gray brown or blackish; albumin oily. The oil is obtained by expression and has a slight, fatty odor and a mild, then acrid taste.

Active Principle.—Fixed oil (U. S. P.).

Action and Uses.—Only the oil is used in medicine. *External:* Strong irritant, vesicant, and pustulant. Formerly used as **counterirritant** in bronchitis, pleurisy, neuralgia, rheumatism, but the pustules are difficult to heal and leave scars; sometimes painted on obstinate cases of ringworm. *Alimentary canal:* Produces increased secretion, colic, and evacuation in one or two hours; alkalies increase the purging; washing with alcohol is said to take out the vesicating principle, leaving the purging principle. Hydragogue **cathartic** in cases of unconsciousness, insanity, apoplexy, eclampsia, impaction of the bowel, lead constipation; the smallness of dose renders it easy to give. Not well to give in pregnancy, organic obstruction, affections of bowels, dropsy. Vermifuge for tapeworms. Large doses usually produce prompt vomiting; symptoms and treatment similar to those of an irritant poison.

Dose.—½ to 2 ♏ (0.03 to 0.12 Cc.).

CASCARILLA.*

Synonym.—Cascarilla.

Botanical Name.—Cro′-ton e-lu-te′-ri-a. *Natural Order:* Euphorbiaceæ. *Habitat:* Bahama Islands.

Part Used.—Bark.

Description.—Quills or curved pieces, having a grayish, corky layer, which is nearly covered with a lichen; uncoated surface being dull brown; inner surface smooth; fracture short and resinous; aromatic odor increased by heating; aromatic bitter taste.

Active Principles.—Volatile oil, Resin, Cascarillin.

Action and Uses.—Similar to calumba. Aromatic bitter stomachic, carminative, mild astringent, febrifuge in intermittents; antispasmodic for asthma.

Dose.—15 to 30 gr. (1 to 2 Gm.).

RICINUS.*

Synonyms.—Castor-oil plant, Palma Christi, Castor bean.

Botanical Name.—Ric′-i-nus com-mu′-nis. *Natural Order:* Euphorbiaceæ. *Habitat:* Asia, Tropics, Subtropics.

Part Used.—Seeds for the production of oil.

Description.—About $\frac{1}{2}$ in. (1.2 Cm.) long, $\frac{1}{4}$ in. (6 Mm.) broad, flat on one side, elliptical, raised raphe, prominent caruncle, mottled gray with other colors, hard, smooth, shining, white embryo embedded in albumin. Seeds contain ricin, a poisonous albuminous substance somewhat resembling snake venom in action. The oil is usually obtained by pressure with heat, but the cold-pressed oil is the best and should be used when obtainable.

Active Principle.—Fixed oil (U. S. P.).

Action and Uses.—Only the oil is used in medicine. *External:* **Protective** and sedative to relieve irritation of foreign matter in the eye or with balsam Peru for burns. Leaves are used as a galactagogue. *Alimentary canal:* Decomposed in intestines, forming ricinoleates, which are irritating; soft

but not very liquid stools result in four to six hours; usually but little griping; constipation may follow, particularly with habitual use. Used as a **cathartic** in constipation of infants, of pregnancy, in diarrhea caused by indigestion or presence of foreign matter, in impaction of the bowels, in dysentery, colic, hemorrhoids, with anthelmintics. Best given in soft capsules; may be given in syrup of sarsaparilla, lemon-juice, brandy and water, with aromatic oils.

Dose.—1 to 8 ʒ (4 to 30 Cc.).

TAPIOCA.*

Synonyms.—Brazilian arrowroot, Cassava.

Botanical Name.—Man'-i-hot man'-i-hot. *Natural Order:* Euphorbiaceæ. *Habitat:* South America, West Indies.

Part Used.—Starch from tuberous roots.

Description.—The prepared tapioca usually occurs in small, irregular, warty masses, about the size of a pea or smaller, hard, white; odorless; nearly tasteless. Obtained by pulping the root, washing with water, allowing starch to settle, then drying in ovens. Roots contain some hydrocyanic acid.

Uses.—Similar to starch. Demulcent and nutritive, for infants and convalescents.

STILLINGIA.

Synonyms.—Queen's root, Queen's delight, Silver leaf, Yaw root.

Botanical Name.—Stil-lin'-gi-a syl-vat'-i-ca. *Natural Order:* Euphorbiaceæ. *Habitat:* North America.

Part Used.—Root.

Description.—Slenderly fusiform, usually in cut pieces, of variable length and $\frac{1}{3}$ to $1\frac{1}{5}$ in. (0.5 to 3 Cm.) in diameter; externally reddish brown, longitudinally wrinkled; fracture fibrous, bark light reddish brown, spongy, finely fibrous, with numerous resin cells, easily separable from the porous, radiate wood; odor distinct; taste bitter, acrid, and pungent.

Active Principles.—Sylvacrol, Volatile oil.

Action and Uses.—**Alterative** in scrofula, syphilis, cutaneous and hepatic diseases; antiperiodic in ague; expectorant, diaphoretic, diuretic, cholagogue, sialagogue.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

KAMALA.*

Synonym.—Rottlera.

Botanical Name.—Mal-lo'-tus phil-ip-pi-nen'-sis. *Natural Order:* Euphorbiaceæ. *Habitat:* Asia, Africa, Philippine Islands.

Parts Used.—Glands and hairs from capsules. *Adulterants:* Red sand, hairs from plant, colored starch, powdered leaves; may be detected by microscope.

Description.—A granular, mobile, brick-red or brownish-red, somewhat resinous powder; odorless; nearly tasteless. Under the microscope it is seen to consist of stellately arranged colorless hairs, mixed with depressed, globular glands, containing club-shaped vesicles. Burns much like lycopodium.

Active Principles.—Resins, Rottlerin.

Action and Uses.—**Vermifuge** for tape, round, and thread worms; drastic purgative, causing considerable griping; next to male fern in efficiency against tapeworms; dose can be repeated several times if necessary; in form of ointment in skin diseases, as scabies and ringworm.

Dose.—1 to 2 ʒ (4 to 8 Gm.).

LACCA.*

Synonyms.—Lac, Shellac.

Botanical Name.—Various trees of different natural orders, particularly Euphorbiaceæ. *Habitat:* Asia, East Indies.

Part Used.—Exudation.

Description.—Sticklac is the resin adhering to thin branches. Seedlac is the same resin detached; it occurs in brown, irregular pieces about the size of a pea or smaller. Shellac

is the lac after boiling with water, fusing and scaling; it occurs in thin, glossy, somewhat translucent masses, varying in color, insoluble in water, soluble in alcohol; odorless; tasteless. Bleached shellac is lac treated with chlorine or sulphurous acid and is not soluble in alcohol or other common solvents. Lac is the exudation from trees caused by the puncture of an insect (Coccus lacca); the impregnated female insect becomes embedded in the exudation and the larva later eats its way out. Some writers say that lac is secreted from the insect.

Active Principles.—Resins.

Action and Uses.—Rarely used in medicine; may be given with other astringents. Used chiefly in varnishes.

RHUS GLABRA.

Synonyms.—Sumach, Smooth, Sleek, Scarlet sumach, Shoemaker.

Botanical Name.—Rhus' gla'-bra. *Natural Order:* Anacardiaceæ. *Habitat:* North America.

Part Used.—Fruit. *Adulterants:* Fruits of allied species.

Description.—Flattened ovoid, $\frac{1}{8}$ to $\frac{1}{6}$ in. (3 to 4 Mm.) in diameter, externally deep crimson, glandular tomentose; endocarp light yellow, smooth, shiny, enclosing a single seed; inodorous; taste acidulous and astringent.

Active Principles.—Tannin, Acid malates of potassium and calcium.

Action and Uses.—**Astringent** for spongy gums, sore throat, stomatitis, mild catarrh of stomach and intestines; refrigerant, diuretic.

Preparation and Dose.—Fluidextract, 5 to 60 ♏ (0.3 to 4 Cc.).

RHUS TOXICODENDRON.*

Synonyms.—Poison oak, Poison ivy, Poison vine, Trailing sumach.

Botanical Name.—Rhus' rad'-i-cans. *Natural Order:* Anacardiaceæ. *Habitat:* North America.

Part Used.—Fresh leaflets.

Description.—Long petiolate, trifoliate; lateral leaflets sessile or nearly so, obliquely ovate, pointed; terminal leaflets stalked, ovate or oval, generally rounded base; leaflets entire and glabrous, or coarsely toothed and downy; fresh leaf contains a juice which darkens; the dry leaf is brittle and thin; odorless; astringent, acrid taste.

Active Principles.—Toxicodendrol, claimed by some to be a volatile acid and by others to be a non-volatile oil.

Action and Uses.—Causes redness, swelling, intense itching, vesicular eruption which may spread and usually lasts ten to fifteen days; in severe cases there may be fever, rheumatoid pains, colicky pains in abdomen, bloody diarrhea, hematuria, but no fatal case reported. Individuals vary greatly in susceptibility; some are poisoned by coming in the vicinity of it, while others can handle it with impunity. Remedies for poisoning seem to vary with individuals and at different times; lead-water, laudanum, fluidextract of grindelia with water (1 to 8), sodium bicarbonate, soap and water, solution of chlorinated soda, diluted ammonia, carbolic acid, corrosive sublimate solution, aristol, have been tried. Used in form of tincture of fresh leaves for paralysis due to rheumatism or exposure to cold and wet, nocturnal incontinence of urine, rheumatism, skin diseases, highly diluted for sprains and burns; favorite remedy of homeopathists.

Dose.—Tincture of fresh leaves (1 to 1), $\frac{1}{10}$ to 1 ♏ (0.006 to 0.06 Cc.).

MASTICHE.

Synonym.—Mastic.

Botanical Name.—Pis-ta′-ci-a len-tis′-cus. *Natural Order:* Anacardiaceæ. *Habitat:* Mediterranean basin.

Part Used.—Resinous exudation. *Adulterants:* Sandarac, olibanum, resins from allied species, sand, bark.

Description.—In subglobular, lenticular, elongated or pear-shaped tears, about $\frac{1}{8}$ in. (3 Mm.) in diameter; pale yellow or greenish yellow, gets darker and less plastic on keeping; transparent, having a glass-like lustre, the surface sometimes

very slightly dusty; brittle, becoming plastic when chewed; odor slight, balsamic; taste mild, terebinthinate. Obtained by making incisions through the bark. Agglutinated tears are inferior.

Active Principles.—Volatile oil, Resins.

Action and Uses.—Mild stimulant, masticatory, solution in ether as a protective to small wounds or on cotton as a temporary filling for teeth. Not much used.

Dose.—15 to 45 gr. (1 to 3 Gm.).

EUONYMUS.

Synonyms.—Wahoo, Spindle tree, Burning bush, Arrow wood, Bursting heart.

Botanical Name.—Eu-on′-y-mus a-tro-pur-pu′-re-us. *Natural Order:* Celastraceæ. *Habitat:* United States.

Part Used.—Bark of root.

Description.—In quilled or curved pieces, 1 to 3 in. (2.5 to 7.5 Cm.) long, and about $\frac{1}{10}$ in. (2.5 Mm.) thick; outer surface ashy or pale brownish gray, with small, dark, scaly patches of soft cork; inner surface whitish or light brown, smooth; fracture short, whitish, with projecting, silky, modified bast fibers; odor distinct; taste sweetish, bitter, and somewhat acrid.

Active Principle.—Euonymin.

Action and Uses.—Gastric stimulant and **tonic** in dyspepsia; chiefly a hepatic stimulant in cases of diseases of the liver; **purgative** similar to rhubarb, but milder, in constipation and dropsy; slight diuretic and expectorant.

Preparations and Doses.—Extract, 1 to 5 gr. (0.06 to 0.3 Gm.). Fluidextract, 10 to 60 ♏ (0.6 to 4 Cc.). Euonymin,* $\frac{1}{2}$ to 5 gr. (0.06 to 0.3 Gm.).

PRINOS.*

Synonyms.—Black alder, Winter-berry.

Botanical Name.—I′-lex ver-ti-cil-la′-ta. *Natural Order:* Ilicaceæ. *Habitat:* North America.

Part Used.—Bark.

Description.—Thin, slender fragments or curved pieces about $\frac{1}{25}$ in. (1 Mm.) thick, brownish gray with whitish patches and blackish dots and lines, the corky part easily separated from the inner green or yellow tissue; fracture short; odorless; bitter, astringent taste.

Active Principles.—Tannin, Bitter principle.

Action and Uses.—Chiefly bitter tonic; astringent in diarrhea, antiperiodic in fevers, alterative in skin diseases.

Dose.—15 to 60 gr. (1 to 4 Gm.).

GUARANA.

Synonym.—Guarana.

Botanical Name.—Paul-lin'-i-a cu-pa'-na. *Natural Order:* Sapindaceæ. *Habitat:* South America.

Part Used.—Dried paste from crushed seeds.

Description.—Generally in cylindrical sticks, 1 to 2 in. (2.5 to 5 Cm.) thick, sometimes in cakes, hard, heavy, nearly smooth, dark reddish brown externally, lighter internally; fracture short and uneven, showing somewhat mottled appearance due to the fragments of seeds and the dark integuments; slight odor; taste slightly astringent, bitter, then sweetish. Seeds are broken up in a wooden mortar, massed with water and sometimes a little tapioca, carefully dried. Used by natives as we do tea.

Active Principle.—Caffeine. U. S. P. requires not less than 3.5 per cent. alkaloids.

Action and Uses.—Similar to caffeine or tea.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

FRANGULA.

Synonyms.—Buckthorn, Alder buckthorn.

Botanical Name.—Rham'-nus fran'-gu-la. *Natural Order:* Rhamnaceæ. *Habitat:* Europe, Asia, Africa.

Part Used.—Bark, collected at least one year before being used. *Adulterants:* Barks of other species.

Description.—In quills of variable length, frequently flattened or crushed; bark about $\frac{1}{2}\frac{1}{5}$ in. (1 Mm.) thick; externally grayish brown to purplish black, with numerous lenticels and occasional patches of foliaceous lichens; inner surface smooth, minutely striated, brownish yellow to deep brown; fracture short and of a purplish tint in the outer layer, fibrous and pale yellow in the inner layer; odor distinct; taste somewhat aromatic, sweetish, and bitter; when chewed, imparting to the saliva a yellow color. Inner side light yellow when first collected. Age and perhaps heat destroys the irritating emetic principle.

Active Principles.—Frangulin, Emodin.

Action and Uses.—Similar to cascara sagrada. Not often used in the United States.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

RHAMNUS PURSHIANA.

Synonyms.—Cascara sagrada, Chittem bark, Sacred bark. *Botanical Name.*—Rham′-nus pur-shi-a′-na. *Natural Order:* Rhamnaceæ. *Habitat:* North America.

Part Used.—Bark collected at least one year before being used. *Adulterants:* Barks of other species.

Description.—In quills or curved pieces, of variable length and $\frac{1}{2}\frac{1}{5}$ to $\frac{1}{5}$ in. (1 to 5 Mm.) thick; outer surface reddish brown, frequently more or less covered with grayish or whitish lichens, several of which are peculiar to this bark, and with small groups of their brownish fruit heads; inner surfaces yellowish to light brownish, becoming dark brown with age and reddened by alkalies, longitudinally striate; fracture short, with projections of bast fibers in the inner bark, and the medullary rays forming converging groups; odor distinct; taste bitter and slightly acrid. As in buckthorn, age destroys the irritating emetic principle.

Active Principles.—Emodin, Resin.

Action and Uses.—Fresh bark is a violent gastro-intestinal irritant. Old bark is a simple purgative, resembling senna, but not griping; stronger and more certain than frangula; soft, painless stools. Best **laxative** for habitual constipation, suitable for children, constipation of pregnancy, catarrhal jaundice, hemorrhoids. The dose does not have to be increased on continued use, but may be diminished on account of the tonic effect.

Preparations and Doses.—Extract, 1 to 8 gr. (0.06 to 0.5 Gm.). Fluidextract and Aromatic fluidextract, 10 to 60 ♏ (0.3 to 4 Cc.).

RHAMNUS CATHARTICA.*

Synonyms.—Buckthorn, Purging buckthorn, Buckthorn berries.

Botanical Name.—Rham'-nus ca-thar'-ti-ca. *Natural Order:* Rhamnaceæ. *Habitat:* Europe, Asia, Africa, North America.

Part Used.—Fruit.

Description.—Globular, about the size of a pea, wrinkled, slightly depressed at apex; greenish gray to black; seed enclosed in greenish pulp; nearly odorless; acrid, nauseous taste.

Active Principle.—Emodin.

Uses.—Hydragogue cathartic.

Dose.—Syrup from juice, 2 to 5 ʒ (8 to 20 Cc.).

ALTHÆA.

Synonyms.—Marshmallow, White mallow, Mortification root.

Botanical Name.—Al-thæ'-a of-fi-ci-na'-lis. *Natural Order:* Malvaceæ. *Habitat:* Europe, Asia, North America.

Part Used.—Root deprived of periderm. *Adulterants:* Old, woody, and discolored roots whitened with lime or calcium sulphate. Powder is often adulterated with starchy substances.

Description.—Tapering, 6 to 12 in. (15 to 30 Cm.) long, rarely exceeding $\frac{4}{6}$ in. (20 Mm.) in diameter; externally

whitish, traversed longitudinally by several broad, shallow furrows, and covered with loosened bast fibers; fracture of bark fibrous, of wood short and granular; internally yellowish white; odor faint; taste sweetish, mucilaginous. Should be collected in second year's growth.

Active Principles.—Asparagin, Mucilage.

Action and Uses.—**Emollient,** as a poultice, in skin diseases; **demulcent** in inflammation of mucous membrane of respiratory, gastro-intestinal, and genito-urinary tracts; slight **diuretic** on account of asparagin; absorbent in pharmacy.

Dose.—Indefinite.

1. GOSSYPII CORTEX. 2. GOSSYPII PURIFICATUM. 3. OLEUM GOSSYPII SEMINIS.

Synonyms.—(1) Cotton-root bark. (2) Purified or Absorbent cotton. (3) Cotton-seed oil.

Botanical Name.—Gos-syp′-i-um her-ba′-ce-um and other species. *Natural Order:* Malvaceæ. *Habitat:* Asia, Africa, North America, cultivated.

Parts Used.—(1) Bark of root. (2) Hairs of seed. (3) Fixed oil of seed. *Adulterants:* Of bark, bark of stem. Of hairs, imperfectly purified hairs.

Description.—Bark: In thin, flexible bands or quilled pieces, the bark about $\frac{1}{40}$ in. (0.6 Mm.) thick; outer surface yellowish brown, longitudinally wrinkled, with small lenticels, the periderm frequently exfoliated and somewhat fuzzy from partly detached bast fibers; inner surface whitish, longitudinally striate; fracture tough, fibrous, the bast layer separable into thin laminæ; odor faint; taste slightly astringent and acrid.

Hairs: White, soft, fine filaments, appearing under the microscope as hollow, flattened, and twisted bands, spirally striate, and slightly thickened at the edges; inodorous and tasteless; compressed in the hand and thrown on the surface of cold water, it should readily absorb the latter and sink; should be perfectly free from all visible impurities.

Oil: A pale-yellow, oily liquid, without odor, and having a bland, nut-like taste.

Active Principles.—Of bark, Resin. Of hairs, Cellulose. Of oil, Olein.

Action and Uses.—BARK: Similar to ergot, but less reliable; **emmenagogue,** abortifacient, uterine hemostatic in menorrhagia and metrorrhagia. HAIRS: **Protective** in burns, blisters, inflamed parts, wounds; used for local application of antiseptics and other remedies, padding for splints, making pyroxylon. Collodion is used to protect abraded surfaces, to close small wounds, but they should be aseptic, otherwise it may do harm. OIL: **Emollient,** as in liniments; nutritive in salad oils, artificial lard, and butter.

Preparations and Doses.—Bark, 10 to 60 gr. (0.6 to 4 Gm.). Oil, 1 to 8 ʒ (4 to 30 Cc.). Pyroxylin, Collodions.

VITIS.*

Synonym.—Grape.

Botanical Name.—Vi'-tis vi-nif'-e-ra. *Natural Order:* Vitaceæ. *Habitat:* Universally cultivated.

Parts Used.—Fruit, Fermented juice of fruit (wine).

Description.—Unnecessary.

Action and Uses.—Wine is used in medicine. See under Alcohol.

OLEUM THEOBROMATIS.

Synonyms.—Cacao butter, Oil of theobroma. Of nut, Chocolate nut.

Botanical Name.—The-o-bro'-ma ca-ca'-o. *Natural Order:* Sterculiaceæ. *Habitat:* Tropical America.

Part Used.—Fixed oil from seed. *Adulterants:* Wax, stearin, tallów.

Description.—A yellowish-white solid, obtained by dividing the fruits, removing the seeds from the pulpy mass, drying them or first letting them sweat in boxes, pits, or ovens to destroy the astringent and bitter principles. Seeds are then pressed between heated plates. The residue is made into chocolate or cocoa.

Active Principle.—Stearin. Nut also contains caffeine and theobromine.

Action and Uses.—Chiefly as suppository base. Emollient in skin diseases; nutritive by inunction in wasting diseases.

COLA.*

Synonyms.—Kola, Kola nut, Bichy nuts, Soudan coffee. *Botanical Name.*—Co′-la a-cu-min-a′-ta. *Natural Order:* Sterculiaceæ. *Habitat:* Africa, West Indies.

Part Used.—Cotyledons, fresh or dried.

Description.—When fresh they are whitish, getting purple brown. Dried cotyledons are 1 to 1½ in. (2.5 to 4 Cm.) long, nearly as broad, one side rounded, the other flat or concave, with sharp edge, somewhat contorted, granular surface; brown outside, lighter inside; heavy, hard, tough; slight odor; astringent, bitter taste.

Active Principles.—Caffeine, Theobromine.

Action and Uses.—Similar to **caffeine**. Tonic, stimulant, diuretic; of benefit in convalescence from acute diseases; relieves mental depression, nervousness, mental fatigue, headache, neuralgia.

Dose.—15 to 60 gr. (1 to 4 Gm.).

THEA.*

Synonym.—Tea.

Botanical Name.—The′-a si-nen′-sis. *Natural Order:* Ternstrœmiaceæ. *Habitat:* Asia, cultivated.

Part Used.—Leaves. *Adulterants:* Other leaves, mineral and coloring matters.

Description.—1 to 3 in. (2.5 to 7.5 Cm.) long, petiolate, oblong-ovate; acute at both ends; prominent midrib; serrate; usually in rolls or cylinders made so now by means of machinery, formerly by hand; bluish green or black; agreeable odor; slightly astringent, bitter taste. Two kinds (1) green and (2) black. (1) Leaves are exposed to sun for an hour or two,

then roasted in pans, next rolled, then dried quickly. (2) Leaves are allowed to remain on trays for about twelve hours, undergoing a slight fermentation, then agitated, allowed to remain in heaps for an hour or more, then alternately heated and rolled.

Active Principles.—Caffeine (theine), Tannin, Theophylline (now made synthetically by a patented process under the name of Theocine).

Action and Uses.—Similar to **caffeine.** Chiefly as a beverage and a stimulant. Theophylline (Theocine) is said to be a strong diuretic.

CAMBOGIA.

Synonym.—Gamboge.

Botanical Name.—Gar-cin'-i-a han-bu'-ri-i. *Natural Order:* Guttiferæ. *Habitat:* Asia.

Part Used.—Gum resin. *Adulterants:* Sand, starchy matter, ground wood, stones.

Description.—In cylindrical pieces, usually hollow in the centre, of variable length, 1 to 2 in. (2.5 to 5 Cm.) in diameter; externally grayish orange brown, longitudinally striate; fracture conchoidal, orange red, waxy, and somewhat porous; inodorous; taste very acrid. Powder bright yellow, sternutatory, containing few or no starch grains. Sometimes in form of cakes and as such is more liable to adulteration. Obtained by breaking off leaves or twigs or making incisions when the yellow, milky juice is caught in bamboo joints, leaves, or cocoanut shells and allowed to harden.

Active Principle.—Resin.

Action and Uses.—Hydragogue **cathartic,** somewhat uncertain, causing severe irritation and considerable griping; best given in pill form with other purgatives; used in hepatic congestion, renal dropsy, uremia. Anthelmintic for tape worms, diuretic.

Dose.—$\frac{1}{2}$ to 5 gr. (0.03 to 0.3 Gm.). Ingredient in Compound cathartic pills.

CANELLA.*

Synonyms.—White cinnamon, False winter's bark.

Botanical Name.—Ca-nel'-la win-ter-a'-na. *Natural Order:* Canellaceæ. *Habitat:* West Indies, North America.

Part Used.—Bark.

Description.—Quills or curved pieces, varying in length, elongated scars, grayish orange outside; fracture short; whitish and striated inside; cinnamon-like odor; acrid, biting taste.

Active Principle.—Volatile oil, Bitter principle.

Action and Uses.—Aromatic, bitter **tonic**; usually given with other tonics. Used with aloes in uterine troubles.

Dose.—15 to 60 gr. (1 to 4 Gm.).

VIOLA.*

Synonyms.—Pansy, Heart's ease.

Botanical Name.—Vi-o'-la tri'-col-or. *Natural Order:* Violaceæ. *Habitat:* Europe, North America.

Part Used.—Flowering herb.

Description.—Stem branching, angular, nearly smooth; leaves somewhat oval, petiolate, with leafy stipules; flowers on long peduncle, of varying colors; odorless; bitter, mucilaginous taste.

Active Principles.—Mucilage, Bitter principle.

Action and Uses.—Rarely used now. Formerly used as an **alterative** in syphilis, scrofula, skin diseases; emollient, demulcent, expectorant in lung troubles.

Dose.—15 to 60 gr. (1 to 4 Gm.).

DAMIANA.*

Synonym.—Turnera.

Botanical Name.—Tur-ne'-ra dif-fu'-sa. *Natural Order:* Turneraceæ. *Habitat:* North America.

Part Used.—Leaves.

Description.—Length and width vary, oblanceolate to obovate; toothed; pale green, whitish hairs; fragrant odor; aromatic, bitter taste.

Active Principle.—Volatile oil.

Action and Uses.—Chiefly used as **aphrodisiac** in sexual atony, but is probably worthless; has some general tonic effect and has been used in atony of the nervous system.

Dose.—½ to 1 ʒ (2 to 4 Gm.).

CACTUS.*

Synonyms.—Night-blooming cereus, Sweet-scented cactus. *Botanical Name.*—Ce′-re-us gran-di-flo′-rus. *Natural Order:* Cactaceæ. *Habitat:* West Indies, cultivated.

Part Used.—Fresh stem and flower. *Adulterants:* Stems and flowers of allied plants.

Description.—Stem has five to six rounded angles bearing clusters of six to eight short spines; somewhat branched; internally largely made up of spongy material around a central woody part; flowers terminal, 8 to 10 in. (20 to 25 Cm.) across, opening at night; white spreading petals shorter than the brownish-yellow sepals; fragrant.

Active Principle.—Cactine.

Action and Uses.—Quickens the heart, shortens the diastole, increases the force, contracts the bloodvessels, raises the blood pressure, gives tone to the nervous system, is not cumulative. Chiefly used in cardiac diseases, particularly aortic regurgitation; contra-indicated in mitral stenosis; can be used in cases where digitalis cannot be; used in cardiac weakness, relative incompetency, convalescence from typhoid and low fevers, dropsy, neurasthenia of climacteric period, sexual exhaustion, dyspepsia, excessive use of tobacco.

Preparations and Doses.—5 to 10 gr. (0.3 to 0.6 Gm.). Tincture (4 ʒ of fresh drug to pint of alcohol), 15 to 30 ♏ (1 to 2 Cc.). Cactine, $\frac{1}{100}$ to $\frac{1}{30}$ gr. (0.0006 to 0.002 Gm.).

ANHALONIUM.*

Synonym.—Mescale buttons.

Botanical Names.—Lo-phoph′-o-ra wil′-liam-si-i and L. le-win′-i-i. *Natural Order:* Cactaceæ. *Habitat:* Mexico.

Part Used.—Stems.

Description.—Button-shaped, 1 to 2 in. (2.5 to 5 Cm.) in diameter; ⅛ to ¼ in. (3 to 6 Mm.) thick; one surface roughened and the other bearing a tuft of hairs. Obtained by cutting off the end of the stem as it comes out of the ground.

Active Principle.—Pellotine.

Action and Uses.—Pellotine is mainly used; first weakens the pulse, then increases force, heart stimulant and adjunct to digitalis; stimulates respiration, adjunct to strychnine; chief use is as a **hypnotic,** by hypodermic injection, producing a quiet sleep from which the patient awakens without ill effect.

Dose.—Pellotine, ½ to 1 gr. (0.03 to 0.06 Gm.).

MEZEREUM.

Synonyms.—Mezereon, Wild pepper, Spurge flax.

Botanical Name.—Daph′-ne me-ze′-re-um and other European species. *Natural Order:* Thymelaceæ. *Habitat:* Europe, Asia, North America.

Part Used.—Bark.

Description.—In long, thin, flexible, tough bands, the edges fringed with partly detached bast fibers; outer surface yellowish or reddish brown, obliquely striate or wrinkled, with numerous lenticels and occasional brownish-black fruit heads of a lichen; inner surface yellowish green or whitish, satiny, lustrous, finely striate; fracture tough, fibrous, the periderm readily separable from the yellowish-green cortex, inner bark lamellated; odor slight; taste very acrid.

Active Principles—Resin, Daphnin.

Action and Uses.—External: **Irritant** and vesicant, particularly the fresh bark, somewhat similar to mustard; used to keep up discharge from blisters and to stimulate indolent

ulcers. *Internal:* **Alterative** in syphilis, scrofula, chronic rheumatism, chronic skin diseases; gastric stimulant, sialagogue, laxative, diuretic. A large dose acts as an intense irritant.

Preparation and Dose.—Fluidextract, 1 to 10 ♏ (0.06 to 0.6 Cc.).

GRANATUM.

Synonym.—Pomegranate.

Botanical Name.—Pu'-ni-ca gra-na'-tum. *Natural Order:* Punicaceæ. *Habitat:* Asia, Subtropics.

Part Used.—Bark of stem and root. *Adulterants and Substitutes:* Rind of fruit, bark of boxwood and barberry.

Description.—Stem Bark: In single quills or transversely curved pieces, mostly 1 to 4 in. (2 to 10 Cm.) long, $\frac{1}{5}$ to $\frac{1}{4}$ in. (5 to 20 Mm.) in diameter; bark $\frac{1}{50}$ to $\frac{1}{8}$ in. (0.5 to 3 Mm.) thick; outer surface yellowish to brownish gray, with brownish-black fruit heads of a lichen and small lenticels; inner surface grayish yellow to brownish, finely striate; fracture short, smooth, the phelloderm layer dark green, the inner bark dull greenish yellow; odor distinct; taste astringent, somewhat bitter.

Root Bark: Dark brown, with more or less longitudinal patches and scales of cork; green phelloderm layer absent; medullary rays extending nearly to the periderm.

Root bark is several times stronger than stem bark; bark of white-flowered variety is best; bark quickly deteriorates.

Active Principles.—Pelletierine, Isopelletierine, Methylpelletierine, Tannin.

Action and Uses.—Efficient **teniacide** for tapeworms. A decoction is often used; generally produces flatulence and purging; may cause intestinal pain, nausea, and emesis and gastro-intestinal irritation; should be preceded and followed by a cathartic if necessary. Pelletierine tannate is more recently used; specific poison to tapeworm, very reliable, does not cause nausea. On account of large amount of tannin a decoction is used as a gargle in sore throat; used in gonorrhea and leucorrhea.

Preparations and Doses.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.). Pelletierine tannate, 3 to 10 gr. (0.18 to 0.6 Gm.).

CARYOPHYLLUS.

Synonym.—Cloves.

Botanical Name.—Eu-ge'-ni-a ar-o-mat'-i-ca. *Natural Order:* Myrtaceæ. *Habitat:* Formerly Molucca Islands, now West Indies, South America, Africa.

Part Used.—Dried flower buds. *Adulterants:* Stems, too young, too old, or exhausted cloves. The powder may contain these and many other substances.

Description.—About $\frac{3}{5}$ in. (15 Mm.) long, brownish black, consisting of a stem-like, solid calyx tube, obscurely four-angled and granular roughened, terminated by four teeth, and surmounted by a globular head, consisting of four petals, which cover numerous curved stamens and one style; odor strongly aromatic; taste pungent and aromatic, followed by slight numbness. Cloves should not float in a horizontal position on water. When buds are changing from green to pink they are picked or knocked on to sheets, dried in the sun and are then brown. From 50,000 to 75,000 tons are imported annually.

Active Principle.—Volatile oil.

Action and Uses.—Cloves may be taken as a type of drugs containing volatile oils. *External:* Oil applied locally produces redness, burning, and anesthesia. Used as an **irritant** and **counterirritant,** in form of spice poultice or oil with other liquids, for colic, rheumatism, myalgia, lumbago, neuralgia; **anesthetic** in toothache and neuralgia; **antiseptic** in skin diseases; **parasiticide** in pediculosis. *Internal:* Stimulates nerves of taste and smell, produces warmth in stomach, increases saliva, gastric and intestinal juices, stimulates peristalsis of stomach and intestines, reflexly stimulates the heart. Used as a **condiment;** as a **carminative** to relieve colic, abdominal pain, griping of purgatives; **antiseptic** in gastric fermentation; **antiemetic, antispasmodic.** Large doses cause gastro-intestinal irritation. Excreted through skin, respiratory and genito-urinary tracts, stimulating and disinfecting them.

Preparations and Doses.—Powder, 5 to 30 gr. (0.3 to 2 Gm.). Oil and Eugenol, 1 to 5 ♏ (0.06 to 0.3 Cc.).

PIMENTA.

Synonyms.—Pimento, Allspice, Clove pepper.

Botanical Name.—Pi-men′-ta of-fi-ci-na′-lis. *Natural Order:* Myrtaceæ. *Habitat:* West Indies, Tropical America.

Part Used.—Nearly ripe fruit. *Adulterants:* Whole fruit rarely adulterated. Powder may have other berries in it.

Description.—Subglobular, $\frac{1}{5}$ to $\frac{1}{3}$ in. (5 to 7 Mm.) in diameter, crowned with a short, four-parted calyx and a short style, or their remnants; externally dark brown; pericarp brittle, glandular punctate; two-celled, each cell containing one reddish-brown, planoconvex, slightly reniform seed; odor and taste peculiarly and agreeably aromatic. Collected when fully mature, but green; it becomes purplish black, fleshy, and free from aromatic properties on ripening. The sun dried is better than the kiln dried.

Active Principle.—Volatile oil.

Action and Uses.—Similar to cloves.

Preparations and Doses.—5 to 30 gr. (0.3 to 2 Gm.). Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.).

MYRCIA.*

Synonyms.—Bay leaves, Bayberry.

Botanical Name.—Myr′-ci-a ac′-ris and other species. *Natural Order:* Myrtaceæ. *Habitat:* West Indies.

Part Used.—Leaves.

Description.—2 to 3 in. (5 to 7.5 Cm.) long; broad ovate, dotted with oil glands; odor resembling cloves.

Active Principle.—Volatile oil.

Action and Uses.—Chiefly in perfumes, bay rum, and hair preparations.

EUCALYPTUS.

Synonyms.—Blue-gum tree, Australian-fever tree.

Botanical Name.—Eu-ca-lyp′-tus glob′-u-lus. *Natural Order:* Myrtaceæ. *Habitat:* Australia, subtropics.

Part Used.—Leaves from older parts of the tree.

Description.—Blade lanceolate, scythe-shaped, 6 to 12 in. (15 to 30 Cm.) long; $\frac{4}{5}$ to $1\frac{1}{2}$ in. (20 to 30 Mm.) broad; tapering, rounded at the base; leathery, pale green, pellucid punctate, veins inconspicuous; margin entire; odor aromatic, camphoraceous; taste aromatic, bitter. Young leaves are ovate, equilateral, and sessile, and should be rejected, as they have but little oil.

Active Principle.—Volatile oil.

Action and Uses.—External: Irritant and **counterirritant**, weaker than oil of turpentine; used for affections of the chest and joints and in skin diseases. Active **antiseptic** and **disinfectant** in surgery, indolent ulcers, wounds, sores; inhaled in bronchitis and ozena. *Alimentary canal:* Increases secretions and peristalsis much like turpentine; **stomachic** in gastric catarrh. *Nervous system:* Antispasmodic, in hysteria, chorea, asthma (in cigarettes). *Circulation:* Small doses increase heart's action; **cardiac stimulant** in convalescence from acute diseases; movement of leukocytes arrested. *Respiration:* Small doses stimulate and disinfect secretions; stimulating **expectorant** in bronchitis. *Genito-urinary tract:* Efficient **diuretic** and stimulating **disinfectant** in chronic nephritis, catarrh of bladder, vaginitis, gonorrhea. **Antiperiodic** in malaria, but inferior to quinine, in intermittent fevers. Trees are of benefit in malarial districts by drying up water and by their exhalations.

Preparations and Doses.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.). Oil, 5 to 15 ♏ (0.3 to 1 Cc.). Eucalyptol, 3 to 10 ♏ (0.2 to 0.6 Cc.).

PANAX.*

Synonyms.—Ginseng, Seng.

Botanical Name.—Pa′-nax quin-que-fo′-li-um. *Natural Order:* Araliaceæ. *Habitat:* North America.

Part Used.—Root.

Description.—Somewhat fusiform, 2 to 3 in. (5 to 7.5 Cm.) long, and about $\frac{1}{2}$ in. (12 Mm.) in diameter; annulated, sometimes one or two side branches, somewhat elastic, yellowish white; thick bark; faint odor; sweetish, mucilaginous taste. The high price which it brings in the Chinese market has stimulated its cultivation here. Chinese buy it by its appearance and the fanciful forms somewhat resembling the body are the most desired.

Active Principles.—Panaquilon, Starch.

Action and Uses.—It is here considered practically valueless. The Chinese use it as a panacea for all ills, particularly dyspepsia, nervous disorders, and sexual impotence.

Dose.—$\frac{1}{2}$ to 2 ʒ (2 to 8 Gm.).

ARALIA.*

Synonyms.—Spikenard, American spikenard, Spignet.

Botanical Name. — A-ra′-li-a ra-ce-mo′-sa. *Natural Order:* Araliaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots.

Description.—4 to 8 in. (10 to 20 Cm.) long, half as thick; large, well-marked stem scars; roots numerous and long; balsamic odor and taste.

Active Principle.—Volatile oil.

Action and Uses.—Alterative in place of sarsaparilla; used in pulmonary affections.

Dose.—15 to 60 gr. (1 to 4 Gm.).

FŒNICULUM.

Synonyms.—Fennel, Sweet or Wild fennel.

Botanical Name.—Fœ-nic′-u-lum vul-ga′-re. *Natural Order:* Umbelliferæ. *Habitat:* Europe, Asia, North America.

Part Used.—Nearly ripe fruit. *Adulterant:* Exhausted fennel.

Description.—Mericarps usually separated, each $\frac{1}{6}$ to $\frac{2}{5}$ in. (4 to 10 Mm.) long, and $\frac{1}{12}$ to $\frac{1}{8}$ in. (2 to 3 Mm.) broad, more or less curved, with five prominent, light-colored primary ribs, otherwise smooth, yellowish or brownish green; pericarp containing an oil tube between each two ribs, and two upon the flat side; odor and taste aromatic, anise-like.

Active Principle.—Volatile oil.

Action and Uses.—Similar to anise.

Preparations and Doses.—10 to 30 gr. (0.6 to 2 Gm.). Oil, 2 to 5 ♏ (0.12 to 0.3 Cc.). Water, 1 to 8 ℥ (4 to 30 Cc.).

CAROTA.*

Synonyms.—Carrot, Wild carrot.

Botanical Name.—Dau'-cus ca-ro'-ta. *Natural Order:* Umbelliferæ. *Habitat:* Asia, Europe, North America.

Part Used.—Seed.

Description.—Oval, planoconvex surfaces, flattened, about $\frac{1}{8}$ in. (3 Mm.) long; five prominent ridges and four lesser ones, the lesser ones having bristles; slight odor; pungent taste.

Active Principle.—Volatile oil.

Action and Uses.—Mild stimulant, carminative, **diuretic** in dropsy and chronic nephritis, emmenagogue.

Dose—10 to 30 gr. (0.6 to 2 Gm.).

ANGELICA.*

Synonyms.—(1) American, Great or Purple angelica. (2) European or Garden angelica.

Botanical Names.—(1) An-gel'-i-ca at-ro-pur-pu'-re-a. (2) A. arch-an-gel'-i-ca. *Natural Order:* Umbelliferæ. *Habitat:* (1) North America. (2) Europe.

Part Used.—Root.

Description.—3 to 6 in. (7.5 to 15 Cm.) long, about $\frac{3}{4}$ in.

(18 Mm.) in diameter; branched, deeply furrowed, brownish gray outside; whitish inside; short fracture; thick bark, soft wood; fragrant odor; spicy sweet, then bitter taste. The European is rather larger, darker, more branched, more resin cells; stronger odor.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Not used much. Stimulant, **tonic**, carminative, alterative, expectorant, diaphoretic, diuretic, emmenagogue.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

ANISUM.

Synonyms.—Anise, Sweet cumin.

Botanical Name.—Pim-pi-nel'-la an'-i-sum. *Natural Order:* Umbelliferæ. *Habitat:* Asia, Europe, North America.

Part Used.—Fruit from cultivated plants. *Adulterants:* Conium seed (detected by appearance, taste, mousey odor when treated with solution of potassium hydroxide), exhausted anise (shrivelled appearance).

Description.—Ovoid, laterally compressed, $\frac{1}{6}$ to $\frac{1}{5}$ in. (4 to 5 Mm.) long; carpels usually cohering and attached to a slender pedicel; grayish or greenish gray to grayish brown; each with a flat face and five light-brown, filiform ridges, and about sixteen oil tubes; odor and taste agreeable and aromatic. Seed from Mediterranean basin is the best.

Active Principle.—Volatile oil.

Action and Uses.—Similar to other drugs containing volatile oils. Largely used as flavoring agent in cough remedies, candy, and food; a good **carminative** for infantile colic and diarrhea; condiment, expectorant.

Preparations and Doses.—5 to 30 gr. (0.3 to 2 Gm.). Oil, 2 to 5 ♏ (0.12 to 0.3 Cc.). Spirit, $\frac{1}{2}$ to 2 ℥ (2 to 8 Cc.). Water, 2 to 8 ℥ (8 to 30 Cc.).

CARUM.

Synonym.—Caraway.

Botanical Name.—Ca′-rum car′-vi. *Natural Order:* Umbelliferæ. *Habitat:* Asia, Europe, North America.

Part Used.—Fruit. *Adulterants:* Exhausted fruit, seeds from weeds, mineral matter.

Description.—About $\frac{1}{6}$ to $\frac{1}{5}$ in. (4 to 5 Mm.) long, oblong; laterally compressed; usually separated into the two mericarps, which are curved, tapering toward each end; dark brown, with five yellowish, filiform ribs, and with six oil tubes; seed plane upon the face, nearly equilaterally pentagonal in transverse section; odor and taste agreeably aromatic. Threshed like ordinary grain. That from Holland is considered the finest.

Active Principle.—Volatile oil.

Action and Uses.—Similar to other drugs containing volatile oils. **Carminative**, corrective for purgatives, condiment in bread.

Preparations and Doses.—10 to 30 gr. (0.6 to 2 Gm.). Oil, 2 to 5 ♏ (0.12 to 0.3 Cc.). Ingredient in Compound tincture of cardamon and Compound spirit of juniper.

ANETHUM.*

Synonym.—Dill.

Botanical Name.—A-ne′-thum gra-ve′-o-lens. *Natural Order:* Umbelliferæ. *Habitat:* Europe, Asia.

Part Used.—Fruit.

Description.—Oval, about $\frac{1}{5}$ in. (5 Mm.) long, flat or slightly concave on one side and convex on the other; three ridges on the back, one ridge along each edge, which is thin and light colored; usually six oil cells; brown; odor and taste similar to caraway.

Active Principle.—Volatile oil.

Action, Uses, and Doses.—Same as caraway.

PETROSELINUM.*

Synonyms.—Parsley, Common or Garden parsley.

Botanical Name.—A′-pi-um pe-tro-se-li′-num. *Natural Order:* Umbelliferæ. *Habitat:* Europe, cultivated.

Parts Used.—Root and fruit.

Description.—Root, 4 to 8 in. (10 to 20 Cm.) long, ½ to 1 in. (1.2 to 2.5 Cm.) thick; spindle-shaped, light brown; annular rings, wrinkled; slight odor when dry; slightly aromatic, sweetish taste.

Seed.—Ovate, about ½ in. (2 Mm.) long, compressed, greenish brown; three ridges on back, two on margin, six oil cells.

Active Principle.—Apiol, occurring as white crystals or greenish oil liquid.

Action and Uses.—Apiol is the preparation generally used. **Emmenagogue** for dysmenorrhea, amenorrhea from anemia; abortifacient, but is useless as such and may cause narcotic poisoning; diuretic in dropsy following scarlatina; feebly antiperiodic, carminative, cardiac stimulant.

Dose.—Apiol, 5 to 15 gr. (0.3 to 1 Gm.).

APIUM.*

Synonym.—Celery.

Botanical Name.—A′-pi-um gra-ve′-o-lens. *Natural Order:* Umbelliferæ. *Habitat:* Europe, cultivated.

Part Used.—Fruit.

Description.—Roundish ovate, flattened, curved, $\frac{1}{25}$ in. (1 Mm.) long, five-ribbed, several oil cells; brown; aromatic odor and taste.

Active Principle.—Volatile oil.

Uses.—Carminative, condiment, flavoring.

CORIANDRUM.

Synonym.—Coriander.

Botanical Name.—Co-ri-an′-drum sa-ti′-vum. *Natural Order:* Umbelliferæ. *Habitat:* Asia, Europe, North America.

Part Used.—Fruit.

Description.—Nearly globular, brownish yellow, smooth, $\frac{1}{6}$ to $\frac{1}{5}$ in. (4 to 5 Mm.) in diameter, crowned with the calyx teeth and a short stylopodium; mericarps usually united, each with five prominent, straight primary ribs and four indistinct secondary ribs; the inner surface deeply concave and with two oil tubes; odor and taste agreeably aromatic. All parts of the plant when bruised have an odor suggestive of bedbugs.

Active Principle.—Volatile oil.

Action and Uses.—Similar to anise.

Preparations and Doses.—10 to 30 gr. (0.6 to 2 Gm.). Oil, 2 to 5 ♏ (0.12 to 0.3 Cc.). Ingredient in Compound spirit of orange, Confection of senna, and Syrup of senna.

CONIUM.

Synonyms.—Hemlock; Poison, Spotted, Wild, or Water hemlock; Cowbane.

Botanical Name.—Co-ni′-um mac-u-la′-tum. *Natural Order:* Umbelliferæ. *Habitat:* Temperate zones.

Part Used.—Full-grown but unripe fruit. *Adulterants:* Anise resembles conium in looks, but not in odor and taste.

Description.—Broadly ovoid, greenish gray; the two carpels of most of the fruits separated; each about $\frac{1}{8}$ in. (3 Mm.) long and about $\frac{1}{16}$ in. (1.5 Mm.) in diameter; ovoid, somewhat curved; the inner, flattened side marked by a deep longitudinal groove; the outer, convex side with five pale-yellow, somewhat crenate ribs; the intervening surfaces wrinkled, but otherwise smooth; pericarp without oil tubes; odor slight, but when triturated with a solution of potassium hydroxide, strong, disagreeable, and mouse-like; taste characteristic, disagreeable, afterward somewhat acrid. Loses strength and should not be used after two years. Leaves have been used, but vary much in strength. Conium has been known since antiquity.

Active Principle.—Coniine. U. S. P. requires not less than 0.5 per cent.

Action and Uses.—External: Thought to be **anodyne**, used in form of poultice for swellings, ulcers, cancers, myalgia. *Nervous system:* Chief action exerted here. Depresses motor nerves commencing at periphery, paralyzes muscular movements; sensory nerves unaffected except by toxic doses. **Antispasmodic** for whooping-cough, tetanus, asthma, epilepsy, acute mania, delirium tremens. *Eye:* First contracted, then soon dilated, accommodation paralyzed, ptosis. Soporific, diuretic, antigalactagogue. Drug varies greatly in strength. Horses and sheep are no affected by it. *Toxicology:* Produces nausea, fatigue, vertigo, paralysis of limbs, ptosis, dilated pupils, difficult swallowing, impaired speech, labored respiration, circulatory depression, death from asphyxia. Empty the stomach; give tannin, stimulants, and artificial respiration.

Preparations and Doses.—Fluidextract, 1 to 10 ♏ (0.06 to 0.6 Cc.). Coniine,* $\frac{1}{2^{1}0}$ to 1 ♏ (0.003 to 0.06 Cc.).

ASAFŒTIDA.

Synonyms.—Asafetida, Food of the Gods.

Botanical Name.—Fer′-u-la fœt′-i-da and probably other species. *Natural Order:* Umbelliferæ. *Habitat:* Asia.

Part Used.—Gum resin from root. *Adulterants:* Chalk, mineral matter, woody tissue, other gum resins and resinous substances; generally adulterated.

Description.—In irregular masses composed of tears of variable size embedded in a yellowish-brown or reddish-brown matrix; when fresh, the tears are tough, yellowish white, and translucent, or milky white and opaque, changing gradually on exposure to pinkish and finally reddish brown, becoming hard and brittle by drying; odor persistent, alliaceous; taste bitter, alliaceous, and acrid. When triturated with water, Asafetida yields a milk-white emulsion which becomes yellowish on the addition of ammonia-water.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Would have a more extended use were it not for the disagreeable odor and taste. An effective gastro-

intestinal **stimulant** and **carminative** in atonic dyspepsia, flatulent colic of infants and neurotic persons, tympanites of some diseases. Stimulant to brain and nervous system; **antispasmodic** in hysteria, chorea, convulsions of children from reflex irritation; mental effect has much to do with its action. **Emmenagogue** in amenorrhea from ovarian torpor, said to be good in habitual miscarriage. Expectorant, diaphoretic, diuretic, aphrodisiac, anthelmintic; sometimes given in effervescing drinks for malingering; stimulates and disinfects secretions from mucous membranes through which it is eliminated.

Preparations and Doses.—5 to 20 gr. (0.3 to 1.3 Gm.). Tincture, 10 to 30 ♏ (0.6 to 2 Cc.). Emulsion, 2 to 8 ℥ (8 to 30 Cc.). Pills.

GALBANUM.*

Synonym.—Galbanum.

Botanical Name.—Fer'-u-la gal-ban-if'-u-la. *Natural Order:* Umbelliferæ. *Habitat:* Asia.

Part Used.—Gum resin. *Adulterants:* Woody tissue, other gum resins; not so liable to sophistication as asafetida.

Description.—Separate tears about the size of peas or irregular masses of agglutinated tears, dark brown, inside of tears whitish and waxy; balsamic odor; acrid bitter taste.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Similar to asafetida and ammoniac, being weaker than former and stronger than latter. Used chiefly in making plasters.

Dose.—10 to 15 gr. (0.6 to 1 Gm.).

SUMBUL.

Synonym.—Musk root.

Botanical Name.—Unknown. *Natural Order:* Probably Umbelliferæ. *Habitat:* Asia.

Parts Used.—Rhizome and roots.

Description.—In transverse segments, of variable length and rarely exceeding 4 in. (10 Cm.) in diameter; externally dusky brown, annulate, longitudinally wrinkled, or with a smooth, silver-gray periderm; fracture short, fibrous, light yellow or brownish yellow, spongy, porous, with numerous brownish-yellow resin reservoirs, and irregular, easily separable fibers; bark about $\frac{1}{50}$ in. (0.5 Mm.) thick; odor strong, musk-like; taste bitter. Ferula sumbul was formerly official, but it is no longer on the market.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Similar to drugs containing volatile oils in general and valerian in particular. Chiefly used in nervous disorders of females.

Preparations and Doses.—Extract, 1 to 10 gr. (0.06 to 0.6 Gm.). Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

AMMONIACUM.*

Synonym.—Ammoniac.

Botanical Name.—Do-re′-ma am-mo-ni′-a-cum. *Natural Order:* Umbelliferæ. *Habitat:* Asia.

Part Used.—Gum resin.

Description.—Roundish tears, $\frac{1}{12}$ to $\frac{1}{4}$ in. (2 to 6 Mm.) in diameter; yellowish brown outside, whitish inside, brittle when cold; flat, waxy fracture, or tears may be united by a brownish matrix; peculiar odor; bitter, acrid taste. Juice exudes through punctures made by insects.

Active Principles.—Volatile oil, Resin.

Action and Uses.—Similar to asafetida, but much weaker. Used in making plasters.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

CORNUS.*

Synonyms.—Dogwood; Florida, Flowering, or American dogwood.

Botanical Name.—Cor′-nus flor′-i-da. *Natural Order:* Cornaceæ. *Habitat:* North America.

Part Used.—Bark of root. *Adulterant:* Bark of stem.

Description.—Curved pieces or quills, irregular size, about $\frac{1}{8}$ in. (3 Mm.) thick; the brown-gray, corky part being more or less removed; reddish brown to purplish, striate; fracture short; odorless; bitter, astringent taste.

Active Principles.—Cornin, Tannin.

Action and Uses.—Simple **bitter**, similar to calumba; once thought to be an efficient antiperiodic, substitute for cinchona in malaria, but has fallen into disuse; somewhat astringent.

Doses.—15 to 60 gr. (1 to 4 Gm.). Cornin, 2 to 5 gr. (0.12 to 0.3 Gm.).

CHIMAPHILA.

Synonyms.—Pipsissewa, Prince's pine, Bitter wintergreen, Ground holly.

Botanical Name.—Chi-maph'-i-la um-bel-la'-ta. *Natural Order:* Ericaceæ. *Habitat:* North America, Europe, Asia.

Part Used.—Leaves. *Adulterant:* Leaves of C. maculata, which are pointed and have a whitish spot on top.

Description.—Oblanceolate, 1 to 2 in. (2.5 to 5 Cm.) long, $\frac{1}{3}$ to $\frac{3}{4}$ in. (8 to 18 Mm.) broad; the upper portion coarsely and sharply serrate, acute or somewhat obtuse; the lower wedge-shaped and nearly entire; coriaceous, smooth, and uniformly dark green on the upper surface, paler beneath; the veins being very prominent; odor slight; taste astringent and bitter.

Active Principles.—Chimaphilin, Arbutin.

Action and Uses.—Bruised fresh leaves are applied locally to ulcers. Excites appetite, promotes digestion, tonic. **Diuretic** and stimulant to genito-urinary tract, used in renal dropsy, albuminuria, dysuria, hematuria; similar to buchu, uva ursi, pareira, perhaps more effective. **Alterative** in scrofulous ulcers, skin affections, gout. Stimulates all excretions.

Preparation and Dose.—Fluidextract, 30 to 60 ♏ (2 to 4 Cc.).

GAULTHERIA.*

Synonyms.—Wintergreen; Checker, Partridge, Box, or Spice berry.

Botanical Name.—Gaul-the'-ri-a pro-cum'-bens. *Natural Order:* Ericaceæ. *Habitat:* North America.

Part Used.—Leaves.

Description.—Thick, coriaceous, oval or obovate, revolute at edge; few serratures ending in a bristle; short petiole; smooth, somewhat glossy.

Active Principle.—Volatile oil which is nearly pure methyl salicylate.

Action and Uses.—The oil being the source of natural salicylic acid it can be used for the same diseases as the acid. It also has the general properties of the volatile oils.

Dose.—Oil, 5 to 30 ♏ (0.3 to 2 Cc.).

UVA URSI.

Synonyms.—Bearberry, Bilberry, Mountain box.

Botanical Name.—Arc-to-staph'-y-los u'-va ur'-si. *Natural Order:* Ericaceæ. *Habitat:* North temperate zone.

Part Used.—Leaves. *Adulterants:* Leaves of mountain cranberry, bog bilberry, box.

Description.—Obovate or oblong spatulate, $\frac{3}{5}$ to $1\frac{1}{5}$ in. (15 to 30 Mm.) long; obtuse; slightly revolute on the margin, tapering into a very short and stout petiole, coriaceous; upper surface dark green, finely reticulate; lower surface slightly pubescent; odor slight; taste strongly astringent and somewhat bitter.

Active Principles.—Arbutin, Ericolin, Urson.

Action and Uses.—Similar to buchu. Promotes appetite, may constipate. Chiefly **diuretic**, acting on the renal epithelium; **antiseptic** on account of the arbutin itself, and the hydroquinone formed; hydroquinone may make urine dark colored, getting darker on exposure to air. Emmenagogue and hemostatic in uterine hemorrhage.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

GUTTA-PERCHA.*

Synonym.—Gutta-percha.

Botanical Name.—Pa-la′-qui-um gut′-ta and other species. *Natural Order:* Sapotaceæ. *Habitat:* Malayan archipelago.

Part Used.—Concrete exudation.

Description.—Grayish or yellowish, often with red-brown streaks; thin, rather horny pieces, somewhat fibrous or porous; plastic at 65° C., soft at 100° C.; odorless; tasteless, exposed to air and sunlight it resinifies and becomes crumbly; in water it remains unchanged for a long time.

Active Principle.—Gutta (a white powder).

Uses.—Solution applied as a protective to exclude air in cases of abrasions, small wounds, fissured nipples, skin diseases, as psoriasis and eczema. When warm it may be molded into any form; used for making splints and other appliances, and in the temporary filling of teeth.

BENZOINUM.

Synonyms.—Benzoin, Gum Benjamin.

Botanical Name.—Sty′-rax ben-zo′-in and an unidentified species. *Natural Order:* Styraceæ. *Habitat:* East Indies, Asia.

Part Used.—Balsamic resin. *Adulterants:* Woody tissue, mineral matter.

Description.—In pebble-like bodies or tears, mostly $\frac{1}{5}$ to 2 in. (0.5 to 5 Cm.) long, and about one-fourth as thick, slightly flattened, straight or curved, yellowish to rusty brown externally, milky white on fresh fracture; separate or very slightly agglutinated (Siam Benzoin), or embedded in a dry, resinous mass, which varies from reddish brown to reddish gray or grayish brown; opaque or slightly translucent and more or

less lustrous (Sumatra Benzoin); brittle, becoming soft on warming, and yielding benzoic acid on sublimation; odor agreeable, balsamic (vanilla-like in the Siam variety); taste slightly acrid. Obtained by making incisions or notches through the bark and about three months later collecting the concrete juice. The product from trees for the first few years is better than that of later tappings.

Active Principles.—Benzoic and Cinnamic acids, Resin, Volatile oil.

Action and Uses.—Same as benzoic acid, but rarely used internally. Compound tincture is used for spongy gums, abrasions, tender nipples, dressing for wounds, skin diseases, psoriasis, eczema, chapped hands, removal of freckles and moth spots, affections of pharynx and larynx by inhalation of steam laden with volatile parts.

Preparations and Doses.—Tincture and Compound tincture, 15 to 60 ♏ (1 to 4 Cc.). Benzoated lard.

DIOSPYROS.*

Synonyms.—Persimmon, Winter plum.

Botanical Name.—Di-os-py′-ros vir-gin-i-a′-na. *Natural Order:* Ebenaceæ. *Habitat:* North America.

Part Used.—Unripe fruit.

Description.—About 1 in. (2.5 Cm.) in diameter; plum-shaped, smooth, green, tough, persistent four-lobed calyx; four to six seeds in separate cells; odorless, very astringent. Edible after frosted.

Active Principle.—Tannic acid.

Action and Uses.—Tonic, antiperiodic, strongly astringent. Used for sore throat, diarrhea, dysentery, hemorrhage.

OLEUM OLIVÆ.

Synonyms.—Olive oil, Sweet oil.

Botanical Name.—O′-le-a eu-ro-pœ′-a. *Natural Order:* Oleaceæ. *Habitat:* Northern Hemisphere.

Part Used.—Fixed oil from ripe fruit. *Adulterants:* Cotton-seed oil, oils of peanut, poppy seed, rapeseed, sesame.

Description.—Pale yellow or greenish liquid, peculiar odor, nut-like; oily, somewhat acrid taste. Obtained by carefully collecting ripe olives and crushing so as not to break the putamen and pressing; this makes the virgin oil; further pressure and crushing gets another yield, but it is inferior. Italy furnishes a large proportion of the oil.

Active Principle.—Oil, largely made up of olein.

Action and Uses.—External: **Emollient** and protective, excluding the air in burns, keeping the skin soft and pliant, removing crusts in seborrhea, eczema, psoriasis; prophylactic, preventing the scattering of scales in scarlet fever; used to relieve earache and destroy insects that may have gotten into the ear. *Internal:* **Laxative** for constipation in infants; demulcent in poisoning by irritants; **nutritive** taken internally or rubbed in when food cannot be taken into the stomach; sometimes given as a solvent for biliary calculi.

Dose.—1 to 16 ℥ (4 to 60 Cc.).

MANNA.

Synonym.—Manna.

Botanical Name.—Fräx'-i-nus or'-nus. *Natural Order:* Oleaceæ. *Habitat:* Mediterranean Basin.

Part Used.—Concrete saccharine exudation. *Adulterants:* Other exudations, glucose, starchy matter.

Description.—In irregular, more or less elongated, flattish, three-sided pieces; externally yellowish white; friable, somewhat waxy; internally whitish, porous, and crystalline; odor suggestive of maple sugar; taste sweet, slightly bitter and faintly acrid. Obtained by making transverse incisions, one above another, catching the milky exudation on tiles, sticks, straws, or other receptacles.

Active Principle.—Mannite (a form of sugar).

Action and Uses.—Chiefly as a laxative for children; may cause flatulence.

Dose.—1 to 8 ℥ (4 to 30 Gm.).

GELSEMIUM.

Synonyms.—Yellow jasmine, Yellow jessamine, Evening trumpet flower.

Botanical Name.—Gel-se'-mi-um sem-per-vi'-rens. *Natural Order:* Loganiaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots. *Adulterants:* Stems (have thin, purplish bark).

Description.—Cylindrical, usually in cut pieces of variable length, from $\frac{1}{5}$ to 1 in. (5 to 25 Mm.) in diameter; externally light yellowish brown, with purplish-brown, longitudinal lines; fracture of the rhizome splintery, the roots breaking with one-half the fracture transverse, the other half oblique or short splintery; wood pale yellow, porous, but tough, with numerous distinct medullary rays; odor slight, characteristic; taste slightly aromatic, bitter.

Active Principles.—Gelsemine, Gelseminine.

Action and Uses.—**Depressant** to circulatory, respiratory, and nervous systems. Used in acute fevers, cerebrospinal meningitis, mania with persistent insomnia, delirium tremens, dysmenorrhea, neuralgia of the fifth nerve, migraine, whooping-cough, tetanus, chorea, and other spasmodic disorders. Taken internally or applied locally to the eye it causes diplopia, ptosis, dilatation of the pupil, having the advantage that the dilatation soon passes off. Gelseminine is said to remove the fear of an impending ordeal as a trial for life or a labor confinement. *Toxicology:* Large doses cause languor, muscular weakness, anxious face, ptosis, subnormal temperature; cold, clammy skin; rapid, feeble pulse; shallow, irregular respiration; strychnine-like convulsions; death by asphyxia; consciousness preserved until late. Treat by giving emetics, tannin, stimulants, heat, artificial respiration.

Preparations and Doses.—Fluidextract, 1 to 5 ♏ (0.06 to 0.3 Cc.). Tincture, 5 to 15 ♏ (0.3 to 1 Cc.). Gelsemine hydrochloride,* $\frac{1}{100}$ to $\frac{1}{40}$ gr. (0.0006 to 0.0015 Gm.).

SPIGELIA.

Synonyms.—Pink root, Maryland, Carolina, or Indian pink, Worm grass.

Botanical Name.—Spi-ge'-li-a ma-ri'-lan'-di-ca. *Natural Order:* Loganiaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots. *Adulterants:* Roots of ruellia (larger and lighter colored), and phlox. Very frequently adulterated or substituted.

Description.—Rhizome of oblique and sharply flexuous growth, somewhat branched, $\frac{3}{5}$ to 2 in. (1.5 to 5 Cm.) long; $\frac{1}{12}$ to $\frac{1}{6}$ in. (2 to 4 Mm.) in diameter; externally dark purplish brown or blackish; the upper surface knotty from approximate stem bases bearing cup-shaped scars; the lower surface with numerous long, rather coarse, finely branched roots; fracture short, showing a yellowish wood and a dark pith; odor somewhat aromatic; taste bitter and pungent.

Active Principle.—Spigeline.

Action and Uses.—**Anthelmintic** against round-worms; should be given with a cathartic, as senna, because it does not always purge and then may be absorbed, producing symptoms of poisoning, as dry skin, vertigo, dilated pupils, spasms, convulsions, coma, asphyxia.

Preparation and Dose.—Fluidextract, $\frac{1}{2}$ to 2 ℥ (2 to 8 Cc.) for an adult.

NUX VOMICA.

Synonyms.—Nux vomica; Dog, Quaker, or Bachelor's buttons; Poison nut, Ratsbane.

Botanical Name.—Strych'-nos nux vom'-i-ca. *Natural Order:* Loganiaceæ. *Habitat:* Asia, East Indies.

Part Used.—Seed.

Description.—Disk-shaped, nearly flat, sometimes irregularly bent, $\frac{3}{5}$ to $1\frac{1}{5}$ in. (15 to 30 Mm.) in diameter; $\frac{1}{8}$ to $\frac{1}{5}$ in. (3 to 5 Mm.) thick; externally grayish or greenish gray, the surface covered with short, closely appressed, satiny hairs; rounded or somewhat acute at the margin, with a slight ridge

extending from the centre of one side to the edge; internally whitish gray, horny, very tough, the endosperm in two more or less regular concavoconvex halves, between which, at one end, lie the heart-shaped, palmately nerved cotyledons; inodorous; taste intensely and persistently bitter. Powder light gray, the epidermal cells modified to strongly lignified hairs. The best seeds are those that have thin edges, light color, greater silkiness, and greater breadth.

Active Principles.—Strychnine (U. S. P. requires not less than 1.25 per cent.). Brucine.

Action and Uses.—External: Antiseptic, but has less effect on lower life than on higher; too poisonous to use. *Alimentary canal:* Increases appetite, salivary, gastric, pancreatic, and biliary secretions; increases peristalsis of stomach and intestines, giving tone to the walls. Used as a bitter **tonic** in anemia, chlorosis, convalescence from acute diseases, general loss of appetite, chronic alcoholism, atonic dyspepsia, catarrh of stomach, headache due to gastric origin; as an **anti-emetic** in vomiting of pregnancy, of phthisis, or drunkards; **laxative** in constipation due to atony of the walls, torpid liver, so-called biliousness, often combined with other purgatives; checks diarrhea when due to atony. *Nervous system:* Motor cells in the cord are stimulated; reflex excitability is greatly increased; nerves of sight, hearing, and touch are more susceptible; sensory nerves are affected much less than motor or vasomotor. **Antispasmodic** and **sedative** in chorea, abdominal cramps, nervousness of pregnancy, neuralgia of anemia; used in local paralysis, particularly where there is no lesion; should not be given during the acute stage of any nervous affection; the effect being largely on the spinal cord, beneficial results often do not follow the giving of strychnine in nervous diseases. *Circulation:* Heart's action is increased by stimulation of the cardiac motor ganglia; blood pressure is raised by this increased action and also by contraction of bloodvessels from stimulation of vasomotor centre. Used as a **cardiac stimulant** in collapse, shock, critical periods of acute illness; cardiac failure from almost any cause, even when death is imminent; in heart diseases where digitalis is contra-indicated; strychnine by hypodermic injection is given when a quick result

is wanted. *Respiration:* Deepened and quickened by stimulating the centre in the medulla; gives tone to the mucous membrane. Used in asthma, dyspnea, many coughs, as that of phthisis, bronchitis, pleurisy, and particularly coughs of neurotic origin; well combined with **expectorants.** *Eye:* Of considerable benefit in impairment of sight from excessive use of tobacco or alcohol or from working with white lead, or from atrophy of the optic nerve. *Kidney:* Contracts the arteries and may lessen the urine and lessen the elimination of strychnine; it may increase the frequency of urination; used in incontinence of urine. *Uterus:* Causes some contraction; promotes menstruation. *Elimination:* Slowly in the urine, saliva, and sweat, as strychnine or some oxidized products. **Aphrodisiac** in functional impotence. **Antidote** to poisoning by chloral, morphine, physostigmine. Brucine resembles strychnine, but is less of a convulsant and more of a paralyzer. Some animals are comparatively insusceptible to strychnine.

Toxicology.—About the smallest fatal dose on record is $\frac{1}{16}$ gr. of strychnine, which killed a child in four hours; $\frac{1}{2}$ gr. killed an adult. Recovery from 7 or 8 gr. has taken place. Symptoms usually commence within one-quarter to one hour and death generally follows in one to three hours. *Symptoms:* A feeling of uneasiness and suffocation, increased reflex irritability, twitchings of the body, great thirst; convulsions, which are first clonic and then tonic. During the convulsion the body may rest on the head and heels (opisthotonos), the face is livid, the eyeballs protruding and staring, muscles of abdomen and chest rigid, contraction of the facial muscles producing a ghastly grin. The spasm may last a few seconds to a minute or longer and is then followed by complete relaxation, which may last for a few minutes to a half-hour and the patient is exhausted and covered with a clammy sweat. Convulsions become more severe and frequent and may jerk the patient out of bed. The acuteness of sight, hearing, and touch is greatly increased, and a light or slight noise or a slight breeze may induce convulsions. Consciousness usually remains until asphyxia sets in. The pulse is rapid and feeble; respiration is labored and during the spasm may be temporarily stopped; there may be frothing at the mouth and dilatation

of pupils. Death by asphyxia may result during the spasm, but more frequently from exhaustion during relaxation. *Diagnosis:* Strychnine does not cause lockjaw until late, while in tetanus the muscles of the jaw are among the first affected; in case of strychnine there is much greater relaxation than in tetanus; history of the case aids diagnosis. *Treatment:* If convulsions have not set in, give emetics, as apomorphine hydrochloride, or wash out the stomach. Chloroform is the best physiological antidote to control the spasms; it has been advised to give a rectal injection of 30 gr. of chloral hydrate and 60 gr. of potassium bromide, keeping the patient under the influence of chloroform until these have time to take affect. Amyl nitrite may be given to cause relaxation of the muscles. Tannin or charcoal may be given to make the alkaloid less easily absorbed. Resort to artificial respiration and the inhalation of oxygen. Physostigmine and gelsemium are of but little service.

Preparations and Doses.—Extract, $\frac{1}{8}$ to $\frac{3}{4}$ gr. (0.008 to 0.05 Gm.). Fluidextract, 1 to 5 ♏ (0.06 to 0.3 Cc.). Tincture, 5 to 20 ♏ (0.3 to 1.3 Cc.). Strychnine, Strychnine sulphate or nitrate, $\frac{1}{100}$ to $\frac{1}{16}$ gr. (0.0006 to 0.004 Gm.). Brucine, $\frac{1}{10}$ to $\frac{1}{3}$ gr. (0.006 to 0.02 Gm.).

IGNATIA.*

Synonym.—St. Ignatius bean.

Botanical Name.—Strych'-nos ig-na'-ti-a. *Natural Order:* Loganiaceæ. *Habitat:* Philippine Islands.

Part Used.—Seed.

Description.—About 1 in. (2.5 Cm.) long, and $\frac{3}{4}$ in. (1.8 Cm.) broad; oblong or ovate, somewhat triangular; brownish gray or blackish; occasionally clusters of hairs, heavy, very hard, horny; albumin somewhat translucent; odorless; very bitter.

Active Principles.—Strychnine, Brucine.

Action, Use, and Dose.—Similar to nux vomica.

CURARA.*

Synonyms.—South American arrow poison, Curare, Woorara.

Botanical Name.—Strych'-nos tox-if'-er-a and other species. *Natural Order:* Loganiaceæ. *Habitat:* South America.

Part Used.—An extract.

Description.—Blackish brown, solid; hygroscopic; very bitter.

Active Principle.—Curarine.

Action and Uses.—Taken into the stomach it is eliminated nearly as fast as absorbed. Injected into the blood its main action is to paralyze. Has been used in tetanus, hydrophobia, epilepsy, and convulsive diseases. Used by natives to put on arrow points.

Dose.—$\frac{1}{10}$ to $\frac{1}{3}$ gr. (0.006 to 0.02 Gm.). Curarine, $\frac{1}{1000}$ to $\frac{1}{32}$ gr. (0.0006 to 0.002 Gm.).

GENTIANA.

Synonyms.—Gentian, Bitter root.

Botanical Name.—Gen-ti-a'-na lu'-te-a. *Natural Order:* Gentianaceæ. *Habitat:* Europe.

Parts Used.—Rhizome and roots.

Description.—In nearly cylindrical pieces or longitudinal slices, of variable length and from $\frac{1}{5}$ to $1\frac{2}{5}$ in. (5 to 35 Mm.) thick; externally yellowish brown; the rhizome annulate, the roots longitudinally wrinkled; fracture short, but uneven; the bark rather thick, separated from the somewhat spongy, reddish-yellow or brownish inner portion by a dark-brown cambium zone; odor strong, characteristic; taste slightly sweetish, strongly and persistently bitter.

Active Principles.—Gentiopicrin, Gentisin, no tannin.

Action and Uses.—Similar to calumba. Perhaps the most common of simple bitters, having a less disagreeable taste.

Preparations and Doses.—Extract, 2 to 10 gr. (0.12 to 0.6 Gm.). Fluidextract, 5 to 30 ♏ (0.3 to 2 Cc.). Compound tincture, $\frac{1}{2}$ to 2 ℥ (2 to 8 Cc.).

CHIRATA.

Synonym.—Chiretta.

Botanical Name.—Swer′-ti-a chi-ray′-i-ta. *Natural Order:* Gentianaceæ. *Habitat:* Asia.

Part Used.—Plant. *Adulterants:* Other species.

Description.—Smooth; root simple, about $\frac{1}{3}$ in. (8 Mm.) thick near the crown; stem about 3 ft. (1 M.) long; externally yellowish or purplish brown, cylindrical near the base, quadrangular and lightly winged above, with numerous opposite, ascending branches; wood yellowish, thin, enclosing usually a large, yellowish, easily separable pith; leaves opposite sessile, ovate lanceolate, entire, five-nerved; flowers numerous, panicled, small, with a four-lobed calyx and corolla; capsule ovoid, acute, one-celled, many-seeded; odor slight; taste intensely bitter.

Active Principles.—Ophelic acid, Chiratin, but very little Tannin.

Action and Uses.—Similar to calumba. Particularly good in dyspepsia with gout. Used as a substitute for cinchona in India.

Preparation and Dose.—Fluidextract, 10 to 30 ♏ (0.6 to 2 Cc.).

FRASERA.*

Synonym.—American colombo.

Botanical Name.—Fra-se′-ra car-o-li-nen′-sis. *Natural Order:* Gentianaceæ. *Habitat:* North America.

Part Used.—Root.

Description.—Fleshy roots or longitudinal slices (formerly transverse slices); yellowish orange outside, lighter inside, resembling gentian in odor and taste.

Active Principles, Action, Uses, Dose.—Similar to gentian.

MENYANTHES.*

Synonyms.—Buckbean, Bogbean, Water shamrock.

Botanical Name.—Men-y-an′-thes tri-fo-li-a′-ta. *Natural Order:* Gentiànaceæ. *Habitat:* North temperate zone.

Part Used.—Leaves.

Description.—Petiolate, trifoliate; leaflets sessile, oval to obovate, smooth, somewhat fleshy, margin entire to crenate, pale green; odorless; bitter taste.

Active Principle.—Menyanthin.

Action and Uses.—**Tonic** and **alterative** in atonic dyspepsia, rheumatism, scrofula, skin diseases; emmenagogue, purgative, vermifuge.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

APOCYNUM.

Synonyms.—Canadian hemp, Black Indian hemp (do not confuse with Indian hemp), Bowman's root.

Botanical Name.—A-poc′-y-num can-nab′-i-num or closely allied species. *Natural Order:* Apocynaceæ. *Habitat:* North America.

Part Used.—Rhizome.

Description.—Of varying length, $\frac{1}{8}$ to $\frac{1}{3}$ in. (3 to 8 Mm.) thick, cylindrical, or with a few angles produced by drying, lightly wrinkled longitudinally, and usually more or less fissured transversely; orange brown, becoming gray brown on keeping; brittle; fracture sharply transverse, exhibiting a thin brown layer of cork, the remainder of the bark nearly as thick as the radius of the wood, white or sometimes pinkish, starchy, containing lacticiferous ducts; the wood yellowish, coarsely porous; almost inodorous; the taste starchy, bitter, and acrid.

Apocynum androsæmifolium, dog-bane, is smaller, tougher, bark is relatively thinner. Constituents somewhat similar to those of the official species, but it is probably much less active.

Active Principles.—Apocynin, Apocynein.

Action and Uses.—Said to resemble strophanthus in its action on the heart and to be a good **diuretic** in dropsy. Diaphoretic, expectorant. In large doses it is emetic and hydragogue cathartic.

Preparations and Doses.—Fluidextract, 2 to 30 ♏ (0.12 to 2 Cc.). Infusion* is a good preparation when used as diuretic, representing about 15 gr. (1 Gm.).

STROPHANTHUS.

Synonym.—Strophanthus.

Botanical Name. — Stro-phan'-thus kom'-bé. *Natural Order:* Apocynaceæ. *Habitat:* Africa.

Part Used.—Seed deprived of awn. *Adulterants:* Frequent, seeds of other species, particularly S. hispidus, which are brown, shorter, thicker, have fewer hairs.

Description.—Of a light fawn-brown color, with a distinct greenish tinge; about $\frac{3}{5}$ in. (15 Mm.) long; lance ovoid, obtuse at the base, gradually acuminate and somewhat acute at the summit, usually twisted, bearing on one side a ridge running from about the centre to the apex; silky lustrous from a dense coating of closely appressed hairs, which mostly lie in longitudinal grooves on the surface; fracture short and somewhat soft, the fractured surface whitish and oily; kernel consisting of a thin endosperm enclosing straight cotyledons; odor slight, or heavy when the seeds are crushed and moistened; taste very bitter. First brought to notice on account of its being used as an arrow poison.

Active Principle.—Strophanthin.

Action and Uses.—Similar to digitalis with the following exceptions: It is quicker in action, better diuretic, better for children and aged persons, does not greatly contract the bloodvessels, and hence does not increase the pressure so much, is not so irritating to the alimentary canal, is not cumulative. The fixed oil in the seed may cause some irritation, but may be removed. The seed deserve more extended use and

would have received it but the drug has been variable in strength.

Preparations and Uses.—Tincture, 1 to 10 ♏ (0.06 to 0.6 Cc.). Strophanthin, $\frac{1}{300}$ to $\frac{1}{100}$ gr. (0.0002 to 0.0006 Gm.).

ASPIDOSPERMA.*

Synonyms.—Quebracho, White quebracho.

Botanical Name.—As-pid-o-sper′-ma que-bra′-cho blan′-co. *Natural Order:* Apocynaceæ. *Habitat:* South America.

Part Used.—Bark. *Adulterant:* The red quebracho is often used or substituted.

Description.—In nearly flat pieces, about $\frac{2}{5}$ to 1 in. (1 to 2.5 Cm.) thick; yellowish gray or brownish outside, deeply fissured; reddish to yellowish brown inside, striate; fracture shows two well-defined strata of about equal thickness, both having whitish dots; odorless; bitter taste; one of the thickest of medicinal barks.

Active Principles.—Aspidospermine, Aspidospermatine. Quebrachine, Aspidosamine. Commercial aspidospermine is a mixture of alkaloids.

Action and Uses.—Renders respiration deeper and slower; aids absorption of oxygen. Used chiefly in dyspnea from various causes, as emphysema, chronic bronchitis, chronic pneumonia, phthisis, some forms of asthma. It is also a bitter **tonic** and **antiperiodic.**

Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

ASCLEPIAS.*

Synonyms.—Pleurisy root, Butterfly weed, Orange swallow-wort, Yellow milkweed.

Botanical Name.—As-cle′-pi-as tu-be-ro′-sa. *Natural Order:* Asclepiadaceæ. *Habitat:* North America.

Part Used.—Root. *Adulterants:* Roots of other species.

Description.—Large, fusiform, longitudinal or transverse sections, 2 to 8 in. (5 to 20 Cm.) long; longitudinally wrinkled,

annulate, orange brown outside; whitish inside; tough, uneven fracture, thin bark; odorless; somewhat acrid, bitter taste.

Active Principle.—Asclepiadin.

Action and Uses.—Carminative in flatulent colic and gastralgia; active **diaphoretic**, in early stages of acute fevers; **expectorant** in pleurisy, catarrh, pneumonia, phthisis, asthma; large doses cathartic and emetic.

Dose.—15 to 60 gr. (1 to 4 Gm.).

ASCLEPIAS INCARNATA.*

Synonyms.—Flesh-colored asclepias, Swamp milkweed, White Indian hemp.

Botanical Name.—As-cle′-pi-as in-car-na′-ta. *Natural Order:* Asclepiadaceæ. *Habitat:* North America.

Part Used.—Root.

Description.—$\frac{3}{4}$ to 1 in. (1.8 to 2.5 Cm.) long; oblong or somewhat globular, hard, knotty, several rootlets that are 3 to 5 in. (7.5 to 12.5 Cm.) long; thin bark, wood tough, thick pith, yellowish brown outside; nearly white inside; odorless; sweet, then acrid taste.

Active Principle.—Asclepiadin.

Action, Uses, and Dose.—Similar to A. tuberosa.

ASCLEPIAS SYRIACA.*

Synonyms.—Common milkweed, Silkweed, Wild cotton.

Botanical Name.—As-cle′-pi-as sy-ri′-a-ca. *Natural Order:* Asclepiadaceæ. *Habitat:* North America.

Part Used.—Root.

Description.—1 to 6 in. (2.5 to 15 Cm.) long; $\frac{1}{4}$ to $\frac{1}{2}$ in. (6 to 12 Mm.) thick; sections finely corrugated, somewhat knotty; short, splintered fracture; tough, bark thick and whitish; yellowish, porous wood; odorless; bitter, nauseous taste.

Active Principle.—Asclepion.

Action, Uses, and Dose.—Similar to A. tuberosa.

CONDURANGO.*

Synonyms.—Condurango, Eagle vine.

Botanical Order: Mars-de'-ni-a Con-du-ran'-go. *Natural Order:* Asclepiadaceæ. *Habitat:* South America.

Part Used.—Bark.

Description.—Curved pieces or quills, yellowish to brown gray; rough; somewhat warty; nearly odorless; bitter.

Active Principle.—Condurangin.

Action and Uses.—**Alterative** for syphilis, reputed as a cancer cure; tonic, sedative.

Dose.—15 to 60 gr. (1 to 4 Gm.).

JALAPA.

Synonym.—Jalap.

Botanical Name.—Ex-o-go'-ni-um pur'-ga. *Natural Order:* Convolvulaceæ. *Habitat:* Mexico.

Part Used.—Tuberous root. *Adulterants:* Tampico jalap (more cylindrical and not marked transversely), Male jalap (irregular fragments or fusiform roots).

Description.—Napiform, pyriform, or oblong, 1 to 3 in. (3 to 8 Cm.) long, and $\frac{2}{5}$ to 2 in. (1 to 5 Cm.) in diameter; the large roots often incised, more or less wrinkled, dark brown, with lighter-colored spots, and short, transverse ridges; hard, compact, internally dark brown, with numerous concentric circles composed of small resin cells; fracture resinous, lustrous, not fibrous; odor slight, but peculiar, smoky, and sweetish; taste sweetish and acrid. Plants should be three years old before collecting. Smoky odor is due to method of drying over wood fires.

Active Principles.—Resin, consisting of Jalapin and Jalapurgin (convolvulin). U. S. P. requires not less than 7 per cent. of total resin.

Action and Uses.—Strong **hydragogue cathartic,** causing some nausea, griping, and great increase in intestinal secretion; watery stools; increases the flow of bile somewhat; acts in

about four hours; more drastic than senna, less irritating than gamboge or mandrake. Used in constipation, all forms of dropsy particularly Bright's disease, and febrile conditions. Diuretic, anthelmintic, and adjunct to other anthelmintics; contra-indicated in inflammatory conditions of the canal.

Preparations and Doses.—Resin, 1 to 5 gr. (0.06 to 0.3 Gm.). Compound powder, 10 to 45 gr. (0.6 to 3 Gm.).

IPOMŒA.*

Synonyms.—Wild jalap, Wild potato, Man root, Man of the earth.

Botanical Name.—Ip-o-mœ′-a pan-du-ra′-ta. *Natural Order:* Convolvulaceæ. *Habitat:* North America.

Part Used.—Root.

Description.—Sometimes reaches a large size; longitudinal slices, shrivelled, irregularly wrinkled; brownish gray outside; grayish white inside; bark thin, woody centre; odor slight; sweetish taste.

Active Principles.—Resin, Panaquilon.

Action and Uses.—Diuretic and cathartic.

Dose.—15 to 60 gr. (1 to 4 Gm.).

SCAMMONIUM.

Synonym.—Scammony.

Botanical Name.—Con-vol′-vu-lus scam-mo′-ni-a. *Natural Order:* Convolvulaceæ. *Habitat:* Asia.

Part Used.—Gum resin. *Adulterants:* Starchy matter, mineral matter, exhausted gum resin, other gum resins; generally adulterated.

Description.—In circular cakes or irregular, angular pieces of various sizes, greenish gray or brownish black, often covered with a grayish-white powder; very brittle, breaking with an angular fracture, porous, and of a resinous lustre; internally of a uniform brownish-black color, more or less translucent in thin fragments; odor peculiar, somewhat

cheese-like; taste slightly acrid. Obtained by cutting off a slice of the root and catching the exudation in shells. One plant yields about 1 ʒ.

Active Principle.—Resin (scammonin).

Action and Uses.—**Hydragogue cathartic**, similar to jalap, but produces more irritation, more colic, is stronger, and less reliable. It seems to be necessary for it to be dissolved in the bile before it acts. Sometimes used as an **anthelmintic** for tapeworms. It is given in combination with other purgatives and carminatives.

Preparation and Dose.—Resin, 1 to 10 gr. (0.06 to 0.6 Gm.). Compound extract of colocynth, 5 to 20 gr. (0.3 to 1.3 Gm.).

ERIODYCTION.

Synonyms.—Yerba santa, Consumptive's weed, Bear's weed, Mountain balm, Gum plant.

Botanical Name.—Er-i-o-dic'-ty-on cal-i-for'-ni-cum. *Natural Order:* Hydrophyllaceæ. *Habitat:* North America.

Part Used.—Leaves.

Description.—Usually occurring in fragments; entire leaf oblong-lanceolate, 2 to 6 in. (5 to 15 Cm.) long, and $\frac{2}{5}$ to $1\frac{1}{5}$ in. (1 to 3 Cm.) broad; acute at the apex, narrowed below into a short, broad petiole; the margin more or less incurved, entire or irregularly serrate, or crenate dentate; upper surface yellowish green, smooth, covered with a brownish resin; lower surface whitish or yellowish white, conspicuously reticulated and densely tomentose; brittle, but flexible in a damp and warm atmosphere; odor somewhat aromatic; taste balsamic and sweetish.

Active Principles.—Resin, Volatile oil.

Action and Uses.—Chiefly as a **vehicle** for the administration of quinine and other disagreeable medicines. **Expectorant** in chronic bronchitis, antispasmodic in asthma, bitter tonic.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

ALKANNA.*

Synonyms.—Alkanet, Dyer's bugloss.

Botanical Name.—Al-kan'-na tinc-to'-ri-a. *Natural Order:* Boraginaceæ. *Habitat:* Europe, Asia.

Part Used.—Root.

Description.—Fusiform, 4 to 12 in. (10 to 30 Cm.) long; often crowned by leaf remains, generally in fragments; wood more or less decayed or worm-eaten, pliable; bark soft, dark purple outside, lighter inside.

Active Principle.—Alkannin (coloring principle).

Use.—Only to give red color to preparations, particularly oils and ointments.

SYMPHYTUM.*

Synonym.—Comfrey.

Botanical Name.—Sym'-phy-tum of-fi-ci-na'-le. *Natural Order:* Boraginaceæ. *Habitat:* Europe, North America.

Part Used.—Root.

Description.—Pieces 1 to 5 in. (2.5 to 12.5 Cm.) long, and about $\frac{1}{4}$ in. (6 Mm.) thick; corrugated, usually bent, fracture short; nearly black externally; grayish white internally; odorless, mucilaginous and slightly astringent.

Active Principle.—Mucilage.

Action and Uses.—Demulcent for diarrhea, dysentery, bronchial irritation, coughs.

Dose.—$\frac{1}{2}$ to 2 ℥ (2 to 8 Gm.).

SCUTELLARIA.

Synonyms.—Skullcap, Blue pimpernel, Hoodwort, Madweed.

Botanical Name.—Scu-tel-la'-ri-a lat-er-i-flo'-ra. *Natural Order:* Labiatæ. *Habitat:* North America.

Part Used.—Plant.

Description.—About 20 in. (50 Cm.) long, smooth; stem quadrangular, branched; leaves opposite, petiolate, ovate, oblong, serrate; flowers in axillary one-sided racemes, pale-blue corolla, bilabiate calyx, becoming closed in fruit; the upper lip helmit-shaped; slight odor; bitterish taste.

Active Principle.—Scutellarin.

Action and Uses.—Of but little value medicinally. Has been used as a nervous **sedative** in chorea, epilepsy, nervous exhaustion.

Preparation and Dose.—Fluidextract, $\frac{1}{2}$ to 2 ℥ (2 to 8 Cc.)

MARRUBIUM.

Synonyms.—Horehound, Hoarhound.

Botanical Name.—Mar-ru'-bi-um vul-ga'-re. *Natural Order:* Labiatæ. *Habitat:* Europe, Asia, North America.

Part Used.—Leaves and flowering tops.

Description.—Branches quadrangular, grayish green, densely white hairy; leaves opposite, petiolate, roundish ovate, $\frac{3}{5}$ to 2 in. (1.5 to 5 Cm.) long; obtuse, coarsely crenate, more or less white hairy, especially underneath; flowers in dense axillary whorls, with a ten-toothed calyx; corolla small, whitish, bilabiate; stamens four; fruit of four ovoid, obtuse, nearly smooth nutlets; odor distinct, rather agreeable; taste somewhat aromatic and bitter.

Active Principle.—Marrubiin.

Action and Uses.—**Expectorant**, largely used in form of candy for sore throat and bronchial affections. Decoction is used as a bitter tonic, diaphoretic, in larger doses a laxative. Has been used for rheumatism, jaundice, hepatic and menstrual troubles.

Dose.—15 to 60 gr. (1 to 4 Gm.).

CATARIA.*

Synonyms.—Catnep, Catmint, Catnip.

Botanical Name.—Nep'-e-ta ca-ta'-ri-a. *Natural Order:* Labiatæ. *Habitat:* Europe, Asia, North America.

Parts Used.—Leaves and flowering tops.

Description.—Square branching stem, hairy; leaves opposite, ovate, cordate, petiolate, crenate serrate, grayish green, covered with soft hairs; flowers white or purplish, lower lip dotted with crimson, calyx tubular, five-toothed, corolla whitish, dilated at throat; characteristic odor; aromatic, slightly bitter, pungent taste.

Active Principles.—Volatile oil, Bitter principle.

Action and Uses.—Chiefly used as a domestic remedy. The infusion is used as a bitter tonic, **antispasmodic** for hysteria, **carminative** for flatulent colic of infants, emmenagogue in amenorrhea, diaphoretic, hypnotic.

Dose.—½ to 2 ℥ (2 to 8 Gm.).

SALVIA.

Synonyms.—Sage, Garden sage, Meadow sage.

Botanical Names. — Sal′-vi-a of-fi-ci-na′-lis. *Natural Order:* Labiatæ. *Habitat:* North temperate zone.

Part Used.—Leaves.

Description.—Long and stoutly petiolate, the blade elliptical or ovate oblong, 1 to 3 in. (2.5 to 7.5 Cm.) long; obtuse or subacute at the summit, rounded or subcordate at the base, finely crenulate, thick, grayish green, very pubescent, especially on the under surface; conspicuously reticulate veined; odor aromatic; taste aromatic, bitter, and somewhat astringent.

Active Principles.—Volatile oil, Tannin.

Action and Uses.—Chiefly as a condiment. Aromatic **tonic**, anhydrotic for hectic fever, diaphoretic for commencement of some fevers, **astringent** for sore throat or mouth, nasal catarrh. Applied to breasts to dry up milk.

Dose.—½ to 2 ℥ (2 to 8 Gm.).

MONARDA.*

Synonyms.—Horsemint, Wild bergamot.

Botanical Name. — Mo-nar′-da punc-ta′-ta. *Natural Order:* Labiatæ. *Habitat:* North America.

Parts Used.—Leaves and flowering tops.

Description.—Stems angular, hairy, branched; leaves oblong, punctate, narrow at base; flowers yellow with brown or purple spots; corolla nearly smooth, tubular, calyx elongated, hairy in throat; aromatic, mint-like odor and taste.

Active Principle.—Volatile oil.

Action and Uses.—Stimulant, carminative, sudorific, diuretic, nervine.

Dose.—½ to 2 ʒ (2 to 8 Gm.).

HEDEOMA.

Synonyms.—Pennyroyal, Squawmint, Mosquito plant.

Botanical Name.—He-de-o′-ma pu-leg-i-oi′-des. *Natural Order:* Labiatæ. *Habitat:* North America.

Parts Used.—Leaves and flowering tops.

Description.—Branchlets quadrangular, with numerous spreading hairs; leaves opposite, short petioled, oblong ovate, ⅗ to 1⅖ in. (15 to 35 Mm.) long; thin, obtuse, obscurely serrate, glandular hairy beneath; flowers in axillary fascicles, with a tubular ovoid, bilabiate, and five-toothed calyx, and a pale-blue, spotted, bilabiate corolla, containing two sterile and two fertile, exserted stamens; odor strong, somewhat mint-like; taste aromatic and pungent. Mentha pulegium, European pennyroyal, is very similar and the oil is closely related.

Active Principle.—Volatile oil.

Action and Uses.—Similar to other drugs containing a volatile oil. Also used for retarded menstruation; frequently used to drive away fleas, mosquitoes, and other insects on account of the odor.

Doses.—½ to 2 ʒ (2 to 8 Gm.). Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.).

MELISSA.*

Synonyms.—Balm, Lemon or Garden balm, Sweet Mary.

Botanical Name. — Me-lis′-sa of-fi-ci-na′-lis. *Natural Order:* Labiatæ. *Habitat:* Europe, Asia.

Parts Used.—Leaves and tops.

Description.—Petiolate, ovate, rounded to subcordate base, crenate, thin, pale green, few hairs; flowers with bell-shaped calyx; whitish or purplish, two-lipped corolla; four stamens; odor fragrant and suggestive of lemon; aromatic, somewhat bitter taste.

Active Principle.—Volatile oil.

Action and Uses.—Similar to other plants containing a volatile oil. A hot infusion is used to induce sweating; a cold infusion is used as a refrigerant in fevers.

Dose.—½ to 2 ℥ (2 to 8 Gm.).

ORIGANUM.*

Synonyms.—Wild marjoram, Wintersweet, Organy.

Botanical Name.—O-rig′-a-num vul-ga′-re. *Natural Order:* Labiatæ. *Habitat:* North temperate zone.

Parts Used.—Leaves and flowering tops.

Description.—Stem branched, often purplish, quadrangular; leaves opposite, petiolate, roundish ovate, nearly entire, pellucid punctate, hairy beneath; flowers in corymbs, calyx five-toothed, corolla two-lipped, purple, stamens four; aromatic odor; aromatic, pungent taste. Origanum majorana, sweet marjoram, is closely allied, has similar properties and uses, often used as a condiment.

Active Principle.—Volatile oil.

Action and Uses.—Similar to other plants containing a volatile oil.

Dose.—½ to 2 ℥ (2 to 8 Gm.).

THYMUS.*

Synonyms.—Thyme, Common or Garden thyme.

Botanical Name.—Thy′-mus vul-ga′-ris. *Natural Order:* Labiatæ. *Habitat:* Europe, cultivated.

Parts Used.—Leaves and flowering tops.

Description.—Stems branched, quadrangular, leaves oblong ovate, or lanceolate, revolute at sides, hairy beneath, dotted with oil cells; flowers bluish purple to whitish, small, in axillary clusters. Thymus serpyllum, wild or mother of thyme, is very similar. Thymol is largely obtained from the oil of Carum ajowan.

Active Principles.—Volatile oil, Thymol (both U. S. P.).

Action and Uses.—Oil: Similar to other oils, but largely used for its antiseptic and disinfectant properties in the same diseases as enumerated under thymol.

Thymol: *External:* **Antiseptic** and **disinfectant,** stronger than phenol, less irritating, less soluble, less quickly absorbed, less poisonous. Used in surgical dressings; in skin diseases, as eczema, psoriasis, acne, ulcers, gangrene; as a mouth-wash in stomatitis, tonsillitis; as a spray in nasal catarrh, ozena, diphtheria; by inhalation in bronchitis, whooping-cough; by injection in gonorrhea, gleet, leucorrhea. **Parasiticide** in ringworm and pityriasis. **Local anesthetic** for toothache, earache. Strength of solution 1 to 100 to 1 to 1000, sometimes with a little alcohol. *Alimentary canal:* Similar to volatile oils; antiseptic in fermentative dyspepsia, diarrhea, typhoid fever; **anthelmintic** for Ankylostomum duodenale. **Antipyretic,** but more dangerous and less reliable than salicylic acid; **diaphoretic.** Eliminated by respiratory and genito-urinary tracts, irritating and disinfecting them; sometimes causes hematuria, and dark, greenish urine. Large doses cause symptoms similar to those of large doses of salicylic acid.

Preparations and Doses.—Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.). Thymol, ½ to 3 gr. (0.03 to 0.18 Gm.); as intestinal parasiticide, 15 to 60 gr. (1 to 4 Gm.) avoiding agents that increase its solubility.

MENTHA PIPERITA.

Synonyms.—Peppermint, Brandy or Lamb mint.

Botanical Name.—Men′-tha pi-pe-ri′-ta. *Natural Order:* Labiatæ. *Habitat:* Europe, North America, Asia.

Parts Used.—Leaves and flowering tops. *Adulterants:* Other varieties, spearmint.

Description.—Branches quadrangular, with scattered, deflexed hairs; leaves petiolate, ovate lanceolate, acute, sharply serrate, light or dark green; flower whorls in oblong or oval spikes which are usually compact, or somewhat interrupted at the base, rounded at the summit; calyx tubular, five-toothed, and often purplish; corolla small, purplish, and four-lobed; stamens four, short and equal; odor strong and characteristic; taste pungent and cooling.

The plant is largely cultivated in Michigan and New York. The oil is obtained by distilling the partially dried plant with steam. The English oil is generally considered the best, although the Japanese oil contains more menthol. Menthol is obtained by chilling the oil and separating the crystals.

Active Principles.—Volatile oil, Menthol.

Action and Uses.—The oil is similar to other volatile oils and is perhaps used more frequently. *External:* Oil has more of a cooling, numbing effect than other oils; **anodyne** for neuralgia, myalgia, toothache, pruritus, rheumatism, sciatica, and other pains. *Internal:* Stomachic, flavoring, **carminative** in colic, nausea, vomiting, diarrhea, cholera morbus. **Antispasmodic** in hiccough, nervous headache, dysmenorrhea. Infusion of the plant is used to start sweating and diuresis in some febrile conditions.

Menthol in the form of a cone or alcoholic solution is frequently used as a **local anesthetic** for headache, neuralgia, sciatica, toothache, pruritus, and parasitic skin diseases. Dissolved in liquid petrolatum and used as a spray for coryza, hay fever, and catarrh. Internally it is an **anti-emetic** for nausea and vomiting.

Preparations and Doses.—Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.). Spirit, 5 to 30 ♏ (0.3 to 2 Cc.). Water, 1 to 8 ℥ (4 to 30 Cc.). Menthol, ½ to 3 gr. (0.03 to 0.18 Gm.).

MENTHA VIRIDIS.

Synonyms.—Spearmint, Mint, Garden, or Lamb mint.

Botanical Name.—Men′-tha spi-ca′-ta. *Natural Order:* Labiatæ. *Habitat:* Europe, North America, Asia.

Parts Used.—Leaves and flowering tops. *Adulterants:* Other species.

Description.—Closely resembling peppermint, but the leaves usually sessile and lanceolate, the flower spikes usually slender, interrupted, cylindrical, or crowded, conical at the apex; the stamens rather long; odor and taste resembling, but distinguishable from those of peppermint.

Active Principle.—Volatile oil.

Action and Uses.—Similar to peppermint. Not used much in medicine, particularly internally.

Preparations and Doses.—Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.). Spirit, 10 to 45 ♏ (0.6 to 3 Cc.). Water, 1 to 8 ℥ (4 to 30 Cc.).

LAVANDULA.*

Synonym.—Lavender.

Botanical Name.—La-van′-du-la of-fi-ci-na′-lis. *Natural Order:* Labiatæ. *Habitat:* Europe, cultivated.

Part Used.—Flowers.

Description.—In terminal cylindrical spikes; calyx about $\frac{1}{5}$ in. (5 Mm.) long; tubular, slightly contracted at the mouth, 5-lobed, covered with short hairs, grayish blue; corolla tubular, two-lipped, upper lip large and two-lobed; lower three-lobed, light blue, hairy, glandular; four stamens; fragrant, characteristic odor; pungent, aromatic taste. Lavandula spica, spike or male lavender, is similar, but the odor is not so delicate.

Active Principle.—Volatile oil (U. S. P.).

Action and Uses.—Similar to other plants containing volatile oils. Chiefly used in perfumery and for flavoring.

Preparations and Doses.—Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.). Spirit and Compound tincture, 10 to 45 ♏ (0.6 to 3 Cc.).

ROSMARINUS.*

Synonym.—Rosemary.

Botanical Name.—Ros-ma-ri′-nus of-fi-ci-na′-lis. *Natural Order:* Labiatæ. *Habitat:* Mediterránean Basin.

Parts Used.—Leaves and flowering tops.

Description.—Leaves about 1 in. (2.5 Cm.) long, sessile, linear, revolute edges, entire, dark green, glossy on top, hairy beneath; flowers, two-lipped, upper two-lobed, lower three-lobed, pale blue; odor aromatic and camphoraceous; taste aromatic, bitter.

Active Principle.—Volatile oil (U. S. P.).

Action and Uses.—Similar to other plants containing volatile oil. Oil is chiefly used externally as an ingredient in liniments and to stimulate the growth of hair.

Preparation and Dose.—Oil, 1 to 5 ♏ (0.06 to 0.3).

COLLINSONIA.*

Synonyms.—Stoneroot, Richweed, Horse-balm.

Botanical Name.—Col-lin-so′-ni-a can-a-den′-sis. *Natural Order:* Labiatæ. *Habitat:* North America.

Part Used.—Rhizome.

Description.—About 4 in. (10 Cm.) long; short, knotty branches and stem scars on top, few roots beneath; very hard, thin bark; grayish brown externally, whitish internally; odorless; sharp, bitter, somewhat nauseous taste.

Active Principle.—Resin.

Action and Uses.—Infusion used as diaphoretic in febrile conditions. Diuretic, tonic, astringent, nerve sedative.

Dose.—15 to 45 gr. (1 to 3 Gm.).

CAPSICUM.

Synonym.—Cayenne, African, Red, Bird, or Pod pepper.

Botanical Name.—Cap′-si-cum fas-tig-i-a′-tum. *Natural Order:* Solanaceæ. *Habitat:* Tropical America, cultivated.

Part Used.—Fruit deprived of its calyx. *Adulterants:* Other varieties. Powder is often adulterated with cornmeal, flour, mineral matter.

Description.—Oblong conical, from $\frac{2}{5}$ to $\frac{4}{5}$ in. (10 to 20 Mm.) long, with a red, shining, membranous, and translucent peri-

carp; two-celled, and containing ten to twenty flat, reniform, yellowish seeds attached to a thick, central placenta; odor distinct; taste intensely pungent. The cultivated fruit varies greatly in size, shape, and color.

Active Principle.—Capsaicin.

Action and Uses.—Somewhat similar to other volatile oils. *External:* Produces redness, pain, vesication. **Irritant** and **counterirritant** in rheumatism, neuralgia, toothache; used to stimulate the growth of hair. Tincture diluted with water may be used as a gargle in tonsillitis, relaxed condition of the mucous membrane and uvula. *Internal:* Produces a feeling of warmth; increases saliva, gastric juice, intestinal juice, peristalsis. Condiment, **tonic, carminative,** in atonic dyspepsia, colic, chronic alcoholism; one of the best substitutes to satisfy the craving in alcohol or opium habit. Continued use or a very large dose may cause gastritis. Cardiac stimulant, contracts bloodvessels, nerve stimulant, diaphoretic. Eliminated largely by the kidneys, acts as a **diuretic,** checks albuminuria; used in nephritis, chronic pyelitis, chronic cystitis. **Aphrodisiac,** used in functional impotence, spermatorrhea.

Preparations and Doses.—Fluidextract, 1 to 3 ♏ (0.06 to 0.18 Cc.). Tincture, 5 to 15 ♏ (0.3 to 1 Cc.). Oleoresin, ¼ to 1 gr. (0.015 to 0.06 Gm.).

BELLADONNÆ FOLIA. BELLADONNÆ RADIX.

Synonyms.—Deadly nightshade, Sleeping nightshade, Death's herb, Poison black cherry.

Botanical Name.—A-tro'-pa bel-la-don'-na. *Natural Order:* Solanaceæ. *Habitat:* Europe, Asia, Africa, cultivated in North America.

Parts Used.—Leaves and roots. *Adulterants:* Of leaves, leaves of henbane, stramonium, scopola; none of them conforming entirely to the description of belladonna. Of roots, scopola, which is difficult to detect unless the rhizome is present; poke-root.

Description.—LEAVES: Usually of a dull, brownish-green color, the leaves much wrinkled and matted together, fre-

quently with the flowering tops intermixed; leaves from 1½ to 8 in. (6 to 20 Cm.) long, 1½ to 5 in. (4 to 12 Cm.) broad, broadly ovate, apex acute, margin entire, narrowed into the petiole; upper surface brownish green, lower surface grayish green; epidermis more or less papillose, particularly on the under surface; odor distinctly narcotic, especially on moistening; taste somewhat bitter and acrid.

Root: In cylindrical or somewhat tapering, longitudinally wrinkled pieces, the bark somewhat incurved at the edges of roots, which have been split before drying; externally pale brownish gray, dusty or mealy; outer layers of the periderm rather soft, frequently abraded, and thus showing lighter patches; fracture nearly smooth, mealy, and emitting a characteristic puff of dust; internally whitish, the older roots showing medullary rays near the bark; nearly inodorous; taste sweetish, afterward bitterish and strongly acrid. The root should be gathered when the plant is from two to four years old, as the percentage of alkaloid seems to be greater then.

Active Principles.—Atropine, Hyoscyamine, Hyoscine, Atropamine, Belladonine. The U. S. P. requires the leaves to contain not less than 0.3 per cent. and the root not less than 0.45 per cent. mydriatic alkaloids.

Action and Uses.—The action of belladonna is practically identical with atropine. *External:* Atropine in solution may be absorbed through the skin. It paralyzes the terminations of the sensory nerves and to a much less extent the motor nerves. **Local anesthetic** and **anodyne**, used for all kinds of pains, as neuralgia, rheumatic affections, acute inflammations, sciatica, abscesses, carbuncles, pruritus. Lessens perspiration, **anhydrotic** applied to feet and axillæ. *Alimentary canal:* Lessens secretion of saliva by paralyzing the terminations of the secretory nerves in the glands; **antisialagogue** for ptyalism of pregnancy or mercury. Diminishes gastric and intestinal secretions, used in serous diarrhea. Stimulates peristalsis by paralyzing the splanchnics, which are inhibitory nerves; **carminative** and **laxative** for colic and constipation, often given with other purgatives to relieve griping. *Nervous system:* Atropine stimulates and then depresses the circulatory,

respiratory, and vasomotor centres in the medulla. It depresses the terminations of the secretory nerves and the nerves in the involuntary muscles, except those in the arterial walls, but not the sensory nerves to any extent when taken internally. **Antispasmodic** for whooping-cough, some forms of asthma (by inhaling smoke from the cigarettes), lead colic, spasmodic dysmenorrhea, spasmodic contraction of the ureters and bile duct, irritability of the bladder. The higher centres in the brain are stimulated incoördinately, causing delirium. *Circulation:* Heart's action is greatly quickened by paralyzing the terminations in the heart of the vagus; the force is not lessened; there is sometimes a primary slowing of the heart due to the stimulation of the vagus. **Cardiac stimulant** in many heart affections, cardiac pain and distress, particularly in collapse from injury or acute disease. Stimulates the vasomotor centre and contracts the abdominal bloodvessels, although it causes the peripheral vessels to dilate, particularly those of the head and neck and perhaps of the brain; the blood pressure is raised, but falls after large doses. *Respiration:* Small doses stimulate and large doses depress; mucous membrane is relaxed, is less irritable; secretion and coughing are lessened. *Eye:* Taken internally or applied locally the pupil is dilated by paralysis of the motor (third) nerve in the circular muscle of the iris, throwing the balance of power to the sympathetic nerve in the radiating fibers of the iris; accommodation is paralyzed and interocular tension is raised. **Mydriatic**, used to make ophthalmic examinations, to break down adhesions. A solution of 1 to 1000 is strong enough to dilate the pupil, but to paralyze accommodation 1 to 100 is used, the effects of which may not entirely pass off for a week. *Skin:* Atropine injected hypodermically is an **anhydrotic** for night-sweats of phthisis; it sometimes causes an eruption. *Kidneys:* Action is uncertain, but urine is generally increased because sweat is diminished. Eliminated very quickly by kidneys. Used in nocturnal incontinence of urine in children. *Temperature:* Raised by stimulation of the heat-producing centre probably, although heat dissipation is increased. **Antigalactagogue**, a local application being made for this purpose.

Formerly used as a prophylactic against scarlet fever. **Antidote** for poisoning by morphine, physostigmine, hydrocyanic acid, ether, chloroform. Children bear it well.

Toxicology.—About the smallest fatal dose reported is 2 gr. of atropine, but 1 gr. would likely cause death. Injected hypodermically symptoms may commence at once, but taken by the mouth they generally come on within a half-hour. If fatal, death usually results within six hours; if the patient lives seven or eight hours he will likely recover. *Symptoms:* Dryness of the mouth, thirst, hoarseness of speech, often nausea, headache, giddiness, pupils dilated, respiration and circulation quickened, often redness about the head, sometimes eruption, skin dry and hot, thirst that nothing satisfies, desire to urinate frequently; then respiration and circulation slow, weak and irregular, restlessness, delirium; death from paralysis of respiration. Death from this drug is not frequent. *Treatment:* Give emetics or wash out the stomach; give tannic acid, hypodermic injection of pilocarpine hydrochloride, ice to the head, and heat to the extremities; stimulants if stage of depression has come on, coffee, strychnine, brandy, artificial respiration.

Homatropine Hydrobromide (U.S.P.) resembles atropine, except it slows the action of the heart and decreases blood pressure. It dilates the pupil more quickly and recovery is much quicker; consequently preferred to atropine for ophthalmic examinations, but not so good where prolonged dilatation is wanted. Rarely given internally.

Preparations and Doses.—Extract of leaves, $\frac{1}{10}$ to $\frac{1}{2}$ gr. (0.006 to 0.03 Gm.). Tincture of leaves, 1 to 15 ♏ (0.06 to 1 Cc.). Fluidextract of root, $\frac{1}{2}$ to 3 ♏ (0.03 to 0.18 Cc.). Atropine, Atropine sulphate, $\frac{1}{200}$ to $\frac{1}{60}$ gr. (0.0003 to 0.0001 Gm.), sometimes as high as $\frac{1}{20}$ gr. (0.003 Gm.). Homatropine hydrobromide, $\frac{1}{200}$ to $\frac{1}{100}$ gr. (0.0003 to 0.0006 Gm.). Plaster, Ointment, Liniment of belladonna, and Oleate of atropine.

SCOPOLA.

Synonym.—Scopola.

Botanical Name.—Sco-po'-la car-ni-ol'-i-ca. *Natural Order:* Solanaceæ. *Habitat:* Europe.

Part Used.—Rhizome.

Description.—More or less curved, cylindraceous, somewhat flattened, mostly in pieces 1 to 3 in. (2.5 to 7.5 Cm.) long, about $\frac{1}{2}$ in. (1.2 Cm.) broad, often split before drying; upper surface marked with closely set, large, cup-shaped stem scars, margins irregularly contracted; externally varying from yellowish brown to dark brownish gray, finely and irregularly wrinkled longitudinally, obscurely annulate and more or less nodular roughened; fracture short and sharp, exhibiting a yellowish-white bark, its corky layer dark brown, or pale brown, wood indistinctly radiate, and central pith rather horny; nearly inodorous; taste sweetish, afterward bitter and strongly acrid.

Active Principles.—Atropine, Hyoscyamine, Scopolamine (hyoscine). U. S. P. requires not less than 0.5 per cent. mydriatic alkaloids.

Action and Uses.—Similar to belladonna; less active externally. Applied to the eye it is quicker in action, but lasts for a shorter time; more toxic and depressing; greater uniformity in percentage of alkaloids. Scopolamine is identical with hyoscine chemically and in action.

Preparations and Doses.—Extract, $\frac{1}{10}$ to $\frac{1}{2}$ gr. (0.006 to 0.03 Gm.). Fluidextract, $\frac{1}{2}$ to 3 ♏ (0.03 to 0.18 Cc.). Scopolamine hydrobromide, $\frac{1}{200}$ to $\frac{1}{100}$ gr. (0.0003 to 0.0006 Gm.).

HYOSCYAMUS.

Synonyms.—Henbane, Hog's bean, Poison tobacco, Stinking nightshade.

Botanical Name.—Hy-os-cy'-a-mus ni'ger. *Natural Order:* Solanaceæ. *Habitat:* Europe, Asia, North America.

Parts Used.—Leaves and flowering tops of the second year's growth. *Adulterants:* Leaves of stramonium, belladonna, too large proportion of stems; not often adulterated.

Description.—Leaves ovate or ovate oblong, the lower with a short petiole, the upper sessile, 2 to 10 in. (5 to 25 Cm.) long, 1 to 4 in. (2 to 10 Cm.) broad; acute, coarsely and angularly toothed or lobed, grayish green, glandular hairy, particularly on the lower surface; flowers nearly sessile, with an urn-shaped, unequally five-toothed calyx and a bell-shaped, purple-veined corolla, which in the fresh state is yellowish; fruit capsular, two-celled, and enclosed in the calyx; odor heavy, narcotic; taste somewhat bitter and nauseous. Leaves are also used from the annual plant and from the first year's growth of the biennial plant, but are supposed to be weaker and are much cheaper than those described above. Seeds are sometimes used; they are flattened, roundish, gray to gray brown, pitted, odorless; have about same constituents as leaves.

Active Principles. — Hyoscyamine, Hyoscine (scopolamine.). U. S. P. requires not less than 0.08 per cent. mydriatic alkaloids.

Action and Uses.—Contains hyoscine, which has somewhat opposite action to atropine and hyoscyamine. It is quite similar to belladonna except that it affects the heart less, causes less excitement and delirium, is a cerebral and spinal sedative, increases peristalsis more, relieves griping, and is more of a sedative to unstriped muscular tissue. It is used in the same diseases as indicated under belladonna and hyoscine, but chiefly as an adjunct to purgatives and a sedative in insomnia of the insane.

Hyoscyamine: Very similar to atropine, but less stimulating to the central nervous system; may slow respiration; about twice as strong in paralyzing the nerve terminations; effect on eye is not quite so lasting.

Hyoscine: Depresses central nervous system; depresses higher functions of the brain, though sometimes it may cause primary delirium; affects the heart but feebly; about twice as strong as atropine in paralyzing the nerve terminations; mydriasis comes on more quickly than with atropine and lasts for a shorter time. It produces a feeling of fatigue and a desire to sleep, which may last five to eight hours, and resembles natural sleep, with no after-effect except some dryness and

thirst. Large doses seem not to increase the hypnotic effect, but to give rise to delirium resembling atropine. Largely used as a hypnotic for insomnia of insane and where there is great mental excitement, in delirium tremens, less reliable than opium as a narcotic. Sedative to quiet restlessness in the treatment of the morphine habit; used in whooping-cough, in neuralgia.

Preparations and Doses.—Extract, ½ to 2 gr. (0.03 to 0.12 Gm.). Fluidextract, 1 to 10 ♏ (0.06 to 0.6 Cc.). Tincture, 3 to 60 ♏ (0.3 to 4 Cc.). Hyoscyamine, Hyoscyamine hydrobromide, Hyoscyamine sulphate, $\frac{1}{200}$ to $\frac{1}{60}$ gr. (0.0003 to 0.001 Gm.). Hyoscine hydrobromide, $\frac{1}{200}$ to $\frac{1}{100}$ gr. (0.0003 to 0.0006 Gm.).

STRAMONIUM.

Synonyms.—Jimson, Jamestown, or Stink weed; Devil's thorn, or Mad apple.

Botanical Name.—Da-tu'-ra stra-mo'-ni-um. *Natural Order:* Solanaceæ. *Habitat:* Asia, naturalized in most temperate countries.

Part Used.—Leaves. *Adulterants:* Leaves of other species.

Description.—Usually of a dark-green or grayish-green color, much wrinkled and matted together, petiolate, 2½ to 8 in. (6 to 20 Cm.) long; inequilaterally ovate, acuminate, very oblique at the base; the large teeth few, acute, with rounded sinuses; thin, brittle; odor distinct, heavy, and narcotic; taste nauseous.

SEEDS: (U. S. P. 1890.) About $\frac{1}{6}$ in. (4 Mm.) long, kidney-shaped, flattened, pitted, wrinkled; nearly black outside, whitish inside; unpleasant odor when bruised; bitter, acrid taste. Have the same active principles as the leaves and about the same amount or more.

Active Principles.—Atropine, Hyoscyamine (chiefly), perhaps some Hyoscine. A mixture is known as daturine. U. S. P. requires not less than 0.25 per cent. mydriatic alkaloids.

Action and Uses.—Similar to belladonna, but it makes the heart more irregular and relaxes the bronchial mucous

membrane more; weaker externally, but stronger internally. It can be used for the same diseases as belladonna, but is more commonly used as an **antispasmodic** for asthma (by inhaling the smoke from cigarettes), for whooping-cough, dysmenorrhea, neuralgia, rheumatism, painful hemorrhoids, fissure, retention of urine.

Preparations and Doses.—Extract, $\frac{1}{10}$ to $\frac{1}{2}$ gr. (0.006 to 0.03 Gm.). Fluidextract, $\frac{1}{2}$ to 3 ♏ (0.03 to 0.18 Cc.). Tincture, 5 to 15 ♏ (0.3 to 1 Cc.). Ointment.

TABACUM.*

Synonym.—Tobacco.

Botanical Name.—Nic-o-ti-a'-na ta-bac'-um. *Natural Order:* Solanaceæ. *Habitat:* Tropical America, widely cultivated.

Part Used.—Leaves. *Adulterants:* Stems and other leaves.

Description.—8 to 20 in. (20 to 50 Cm.) long, about one-third as wide, thin, oval to ovate lanceolate, acute, entire, prominent midrib, somewhat hairy, friable, brown; heavy narcotic odor; nauseous, acrid, bitter taste. In drying certain changes take place, modifying the odor.

Active Principle.—Nicotine.

Action and Uses.—Rarely used in medicine. Causes severe gastro-intestinal irritation and collapse and the corresponding symptoms. It is a **depressant**, emetic, and laxative; formerly used to relax muscular spasm in reducing dislocations, in asthma, hiccough, tetanus. It is used externally in some skin diseases and as a **parasiticide**. In the use of tobacco toleration is soon established. Moderate smoking has a quieting effect on restlessness and a stimulating effect on the bowels. Overindulgence may cause inflammation of the respiratory tract, indigestion, "tobacco heart," nervous symptoms, dimness of vision, and blindness.

Doses.—Tobacco, $\frac{1}{2}$ to 5 gr. (0.03 to 0.3 Gm.). Nicotine, $\frac{1}{60}$ to $\frac{1}{6}$ gr. (0.001 to 0.01 Gm.).

FABIANA.*

Synonym.—Pichi.

Botanical Name.—Fa-bi-a′-na im-bri-ca′-ta. *Natural Order:* Solanaceæ. *Habitat:* South America.

Part Used.—Leafy branches.

Description.—Ash-colored bark; numerous small, elevated glands having a resinous appearance; wood tough and yellow, numerous small branches thickly covered with leaves; leaves scale-like, sessile, entire, glaucous, blue green; aromatic odor; bitter, aromatic taste.

Active Principles.—Resin, Fabianine.

Action and Uses.—**Diuretic** similar to buchu, lithontriptic, tonic, cholagogue; used in inflammation and catarrh of the urinary tract, hematuria, calculi, later stages of gonorrhea.

Dose.—15 to 60 gr. (1 to 4 Gm.).

DULCAMARA.*

Synonyms.—Bittersweet, Woody nightshade, Wolf grape.

Botanical Name.—So-la′-num dul-ca-ma′-ra. *Natural Order:* Solanaceæ. *Habitat:* Europe, Asia, North America.

Part Used.—Young branches. *Adulterants:* Rhizome of soaproot, hop-stems.

Description.—Short sections, about $\frac{1}{5}$ in. (5 Mm.) in diameter, nearly cylindrical, somewhat angular, striate, warty, hollow in centre, thin bark, alternate leaf scars, greenish brown outside, lighter inside; slight odor; bitter-sweet taste. The red berries are sometimes eaten by children, with toxic effects.

Active Principles.—Solanine, Dulcamarin.

Action and Uses.—But little used in medicine. **Diuretic, diaphoretic**; formerly used for rheumatism, chronic bronchitis, catarrhs, but now chiefly used as an **alterative** in skin diseases, as acne, eczema. Solanine has been recommended as antispasmodic in vomiting of pregnancy, in spasmodic asthma, locomotor ataxia, sciatica.

Dose.—15 to 60 gr. (1 to 4 Gm.).

LEPTANDRA.

Synonyms.—Culver's root, Culver's physic.

Botanical Name. — Ve-ron'-i-ca vir-gin'-i-ca. *Natural Order:* Scrophulariaceæ. *Habitat:* North America.

Parts Used.—Rhizome and roots.

Description.—Rhizome somewhat bent and branched, 2 to 6 in. (5 to 15 Cm.) long, $\frac{1}{8}$ to $\frac{1}{3}$ in. (3 to 8 Mm.) thick; cup-shaped scars on upper surface, roots and root scars on sides and lower surface, annulate, fracture tough and woody, branches easily separated from the main rhizome, gray brown to blackish brown outside, hard wood and yellowish inside; pith large and purplish brown; roots slender, fragile, wrinkled longitudinally; odor slight; bitter, slightly acrid taste.

Active Principle.—Leptandrin.

Action and Uses.—Resembles mandrake to some extent. **Cholagogue,** increasing the bile and intestinal secretions; used for duodenal indigestion and chronic constipation. Fresh root is a violent emetic and cathartic.

Preparations and Doses.—Extract, 2 to 5 gr. (0.12 to 0.3 Gm.). Fluidextract, 15 to 60 ♏ (1 to 4 Cc.). Leptandrin,* 2 to 5 gr. (0.12 to 0.3 Gm.).

DIGITALIS.

Synonyms.—Foxglove, Fairy bells, fingers or gloves.

Botanical Name. — Dig-i-ta'-lis pur-pu'-re-a. *Natural Order:* Scrophulariaceæ. *Habitat:* Europe.

Part Used.—Leaves from second year's growth. *Adulterants:* Not often adulterated. Leaves of first year's growth (not easily detected), of mullein, of comfrey.

Description.—More or less crumpled and broken, ovate to oval, 4 to 12 in. (10 to 30 Cm.) long, one-half as broad; abruptly contracted to a winged petiole from 2 to 4 in. (5 to 10 Cm.) long, thin; upper surface wrinkled, sparsely hairy; lower surface dull pale green, or grayish, densely and finely hairy, the venation conspicuously reticulated; margin crenate;

the midrib and principal veins broad and flat, usually purplish, the lower veins continued into the wings of the petiole; odor slight, characteristic; taste strongly bitter. Should be collected during flowering; first-year leaves are inferior; wild leaves are thought by some to be stronger than the cultivated. Exposed to moisture and light the active principles are easily decomposed and some authorities state that leaves should not be kept longer than a year.

Active Principles.—Digitalin, Digitoxin, Digitonin.

Action and Uses.—External: But little effect; applied to mucous membrane it produces irritation and later paralysis of sensory nerve endings. *Alimentary canal:* Large doses cause gastro-intestinal irritation; smaller doses continued cause gastric irritability, loss of appetite, nausea. *Nervous system:* Stimulates vagus and vasomotor centre; may cause headache, dizziness, hallucinations, and delirium, but these are due largely to the change in circulation in the brain. *Circulation:* Heart's action is slowed, length of diastole is increased; the length of systole not affected, but the force is greatly increased; irregular heart is made regular; this is due to direct action on cardiac muscle and stimulation of the vagus. The arteries are contracted because of the stimulation of the vasomotor centre; continued use may cause dilatation. Blood pressure is raised. The patient should be kept in a recumbent position when taking full doses; the heart being strained by the drug may not be able to do the extra work put upon it when the patient sits up. Digitalis is of benefit in mitral regurgitation; the lengthened diastole allows more time for the blood to flow into the ventricle, the flaps approximate better by lessening the dilatation of the heart, the beat is more regular, the heart is better nourished and gets more rest. The disadvantage of increased pressure is more than counterbalanced. Mitral constriction and tricuspid regurgitation and constriction are benefited in the same way. The drug is generally contra-indicated in aortic regurgitation and constriction. It is a **cardiac tonic** and **stimulant** in palpitation, in exhaustion from pericarditis, typhoid fever, scarlet fever, pneumonia, other acute diseases, irregularity from overexercise. As a hemostatic the increase of blood pressure more than

balances the contraction of vessels, consequently is of but little service. *Respiration:* But little effect except in toxic doses. *Kidney:* Somewhat uncertain **diuretic** whose action is not thoroughly understood; urine is increased in case of dropsy and may be a little in health, due probably to a change in blood pressure, perhaps to some action on the renal epithelium, perhaps to the different principles in the drug having different actions. Used in early stages of Bright's disease and in other dropsies; often combined with squills and other diuretics. *Temperature:* Medicinal doses have no effect in health; in fever it may cause a primary rise and then a fall. Not used as antipyretic. *Uterus:* Causes contraction, resembling ergot; used in menorrhagia. Digitalis is given as the type of cumulative drugs. It is slowly absorbed and slowly eliminated and may gradually accumulate and its elimination suddenly stop on account of the great contraction of the renal vessels. Somewhat anaphrodisiac, used in spermatorrhea.

Toxicology.—The symptoms are nausea, vomiting, colic, purging, headache, lowered temperature, hallucinations; pulse full and slow at first, sometimes becoming rapid and at other times very slow; change in position makes the heart irregular, respiration first slow, then rapid and feeble; cyanosis, coma, convulsions; death by paralysis of the heart. Treatment is to wash out the stomach, give tannin, aconite, saponin, and diffusible stimulants.

Preparations and Doses.—Extract, $\frac{1}{8}$ to $\frac{1}{2}$ gr. (0.008 to 0.03 Gm.). Fluidextract, $\frac{1}{2}$ to 2 ♏ (0.03 to 0.12 Cc.). Tincture, 5 to 20 ♏ (0.3 to 1.3 Cc.). Infusion, 1 to 4 ℥ (4 to 15 Cc.). Digitalin,* $\frac{1}{100}$ gr. (0.0006 Gm.) commencing dose unless the strength of the sample has been previously determined.

CAFFEA.*

Synonym.—Coffee.

Botanical Name.—Cof-fe′-a a-ra′-bi-ca. *Natural Order:* Rubiaceæ. *Habitat:* Africa, Asia, cultivated.

Part Used.—Seed. *Adulterants:* Inferior seeds, artificial seeds. Of ground coffee, chicory, dandelion.

Description.—Oval; flat on one side, which is furrowed longitudinally; thin, papery endocarp; two seeds have flat sides adjoining in the fruit; hard, grayish; faint odor; slightly bitter taste. The roasting decomposes some principles with the formation of an aroma upon which the commercial value of coffee depends.

Active Principle.—Caffeine.

Action and Uses.—In medicine the same as caffeine. *Alimentary canal:* Caffeine has practically no effect, but coffee stimulates peristalsis; excessive tea drinking causes indigestion from the tannin. *Nervous system:* The cerebrum is stimulated by having more blood sent to it and later it is depressed, the general action being one of stimulation and then depression; the person is made wakeful and the capacity for work is increased. It is used in neuralgic or nervous headaches, fatigue, insomnia of alcoholism. *Circulation:* Caffeine increases the force of the heart's contraction and the time of systole, the time of diastole is lengthened, blood pressure is raised. It is a **cardiac stimulant** used in fevers, injuries, operations, collapse, with antipyretics, in aortic or mitral obstruction. *Respiration:* Stimulated. *Kidneys:* **Diuretic**, due to stimulation of the epithelium and to increased blood pressure; it is used in dropsy and pleuritic effusion. Toleration is soon established, so that it has less effect on the kidneys. Caffeine is an **antidote** for poisoning by opium and other narcotics. Theobromine is similar to caffeine in action. Sodium theobromine salicylate (diuretin) occurs as a nearly white powder; sweetish, saline taste; used as a diuretic.

Preparations and Doses.—Caffeine, citrated caffeine, ½ to 5 gr. (0.03 to 0.3 Gm.). Effervescing citrated caffeine, ½ to 2 ℥ (2 to 8 Gm.). Diuretin, 10 to 15 gr. (0.6 to 1 Gm.).

IPECACUANHA.

Synonyms.—Ipecac. (1) Rio, Para, or Brazilian ipecac. (2) Carthagena ipecac.

Botanical Names.—(1) Ceph-a-e'-lis ip-e-cac-u-an'-ha. (2) C. a-cu-mi-na'-ta. *Natural Order:* Rubiaceæ. *Habitat:* South America.

Parts Used.—Root and not more than 7 Cm. of the stem. *Adulterants:* Inferior ipecac that has been manipulated, other species, Richardia scabra. Adulteration is common.

Description.—Rio Ipecac: In pieces of irregular length, rarely exceeding 10 in. (25 Cm.); stem portion $\frac{1}{12}$ to $\frac{1}{8}$ in. (2 to 3 Mm.) thick, light gray brown, cylindrical and smoothish; root portion usually red brown, occasionally blackish brown, rarely gray brown, $\frac{1}{8}$ to $\frac{1}{4}$ in. (3 to 6 Mm.) thick, curved and sharply flexuous, nearly free from rootlets, occasionally branched, closely annulated with thickened, incomplete rings, and usually exhibiting transverse fissures, with vertical sides, through the bark; fracture short; the very thick, easily separable bark whitish, usually resinous; the thin, tough wood yellowish white, without vessels; odor very slight, peculiar; the dust sternutatory; taste bitter and nauseous, somewhat acrid.

Carthagena Ipecac: Similar to Rio ipecac, but about one-half thicker, dull gray externally, with thinner, merging annulæ, and the fractured surface of the bark gray.

The alkaloids are chiefly in the bark and only slightly in the wood; the stem has less than the root. The high price is due to some extent to the fact that the juice of the fresh plant is very irritating and the natives will not dig the root when they can get other work.

Active Principles.—Emetine, Cephaeline. U. S. P. requires not less than 1.75 per cent. alkaloids.

Action and Uses.—External: Some people are very susceptible to the irritating effect on the mucous membrane, as shown by the sneezing or asthma brought on by inhaling a very small amount of the dust. It is **antiseptic**, killing anthrax. Used in cases of insect bites, bee stings, poison ivy, by applying a paste. *Alimentary canal:* Small doses increase secretions of saliva, gastric juice, bile; used as a **stomachic** in dyspepsia, **cholagogue** in catarrhal jaundice, and hepatic disorders. Large doses cause nausea, vomiting in twenty or thirty minutes, not much depression further than that from vomiting; continued large doses soon set up toleration; acts by irritating the stomach and by stimulating the vomiting nerve centre; contra-indicated in the feeble; too slow in case of poisoning. Used as **emetic** to clear the air passages in children

and infants, spasmodic croup, bilious headache, acute indigestion, the commencement of eruptive fevers, pneumonia. In very large doses it acts as a **specific** for epidemic dysentery (not so good in chronic dysentery), cholera morbus, summer complaint in children, diarrhea of teething. **Antiemetic** in very small doses in case of vomiting of pregnancy, and nervous vomiting. *Circulation:* Very little effect on the heart; vessels are contracted. Used as **hemostatic** in small, often repeated doses in hemoptysis, epistaxis, uterine hemorrhage. *Respiration:* Not affected by small doses; quickened from vomiting; by elimination through the mucous membrane or by inhalation it increases and lessens the tenacity of the secretion, and causes coughing. **Expectorant,** used in winter cough, emphysema, chronic bronchitis. *Skin:* In small doses, as in Dover's powder, it is partially eliminated through the skin, increasing sweat; **diaphoretic** in chills, in mild febrile conditions, suppression of menstruation, acute rheumatism.

Preparations and Doses.—Fluidextract, $\frac{1}{2}$ to 2 ♏ (0.03 to 0.12 Cc.) as expectorant; 5 to 30 ♏ (0.3 to 2 Cc.) as emetic. Syrup and wine, 5 to 20 ♏ (0.3 to 1.3 Cc.) as expectorant; 1 to 8 ℥ (4 to 30 Cc.) as emetic. Tincture ipecac and opium, 5 to 20 ♏ (0.3 to 1.3 Cc.). Powder of ipecac and opium, 5 to 20 gr. (0.3 to 1.3 Gm.). Emetine,* $\frac{1}{120}$ to $\frac{1}{40}$ gr. (0.0005 to 0.0015 Gm.) as expectorant; $\frac{1}{12}$ to $\frac{1}{4}$ gr. (0.005 to 0.015 Gm.) as emetic.

RUBIA.*

Synonym.—Madder.

Botanical Name. — Ru'-bi-a tinc-to'-ri-um. *Natural Order:* Rubiaceæ. *Habitat:* Europe, Asia.

Part Used.—Root.

Description.—Long, cylindrical, about the thickness of a quill, branched, epidermis thin, spongy wood, brownish red; feeble odor; astringent, bitter taste.

Active Principles.—Alizarin, Rubian.

Uses.—Not used much now in medicine; has been used as a diuretic and emmenagogue.

1. CINCHONA. 2. CINCHONA RUBRA.

Synonyms.—Peruvian bark. 1. (*a*) Ledger bark. (*b*) Yellow cinchona, Calisaya bark. (*c*) Pale cinchona, Crown or Loxa bark. 2. Red cinchona, Red bark.

Botanical Names.—1. (*a*) Cin-cho′-na ledg-er-i-a′-na. (*b*) C. cal-i-sa′-ya. (*c*) C. of-fi-ci-na′-lis. 2. C. suc-ci-ru′-bra. Hybrids of all these and other species. *Natural Order:* Rubiaceæ. *Habitat:* South America, cultivated.

Part Used.—Bark. *Adulterants:* Substitution of one kind for another, which is quite common; inferior grades treated with ammonia and sold for red bark; Maracaibo bark (C. cordifolia).

Description.—1. Cinchona: In quills or curved pieces of variable size, $\frac{1}{12}$ to $\frac{1}{5}$ in. (2 to 5 Mm.) thick; externally gray, rarely brownish gray, with numerous intersecting, transverse, and longitudinal fissures, which have nearly vertical sides; the outer bark may be absent, the color externally being then cinnamon brown; inner surface light cinnamon brown, finely striate; fracture of the outer bark short and granular, of the inner finely splintery; powder light brown or yellowish brown; odor slight, aromatic; taste bitter and somewhat astringent.

2. Red Cinchona: In quills or curved pieces of variable size, $\frac{1}{12}$ to $\frac{1}{5}$ in. (2 to 5 Mm.) thick; externally gray or grayish brown, more or less rough from longitudinal rows of warts, or from warty ridges which are sometimes fissured, the transverse fissures rarely numerous or much intersected, and having their sides sloping; inner surface reddish or orange brown, distinctly striate; fracture short and granular in the outer, shortly and rather coarsely splintery in the inner bark.

Ledger and calisaya barks are quite similar and are richest in quinine, the demand for them being on the increase; the ledger bark is the one most extensively cultivated. The red cinchona contains a much smaller proportion of quinine, but is used as a bitter tonic and required to have at least a certain percentage of the bitter alkaloids. The cultivated is better than the wild; the "mossed" is better than the unmossed; the

"renewed" is better than the "mossed." Bark on the shady side is better than that on the sunny side. The bark of the root is superior to that of the stem, and the bark of the branches inferior. The tree grows best on the side of a mountain where the mean temperature is about 55° F. and where the rainy season lasts for nine months and there is more or less fog the other three months. Most of the cultivated bark is grown in Java and India, the Indian going to England. There are different methods of collecting, the mossing being the best. Alternating strips of bark are taken off and the tree then bound in moss, grass, or other material. The next year the old bark ("mossed") is removed, the tree being bound up. The following year the bark left the year before ("renewed") is taken.

Active Principles.—Quinine, Quinidine, Cinchonidine, Cinchonine. Besides these there are about twenty-five or thirty other alkaloids. U. S. P. requires barks recognized under cinchona to contain 4 per cent. ether-soluble alkaloids and all barks to contain 5 per cent. total alkaloids.

Action and Uses.—Quinine is the chief alkaloid and the one here discussed, the others acting much like it. *External:* Irritant to the mucous membrane. It is a protoplasmic poison; a solution (1 to 250) killing the lower forms of life and inhibiting the action of digestive ferments to some extent. Rarely used externally except for its systemic effect when it cannot be given by the mouth. *Alimentary canal:* Stimulates secretion of saliva and gastric juice, sharpens the appetite, increases the peristalsis of the stomach, aids digestion. Long-continued use may cause indigestion, gastric catarrh, and constipation. One of the most common **tonics**, often combined with iron and strychnine, in general lowered vitality, anemia, atonic dyspepsia, gastric catarrh of drunkards, convalescence from acute diseases. *Nervous system:* The cerebrum is slightly stimulated by small doses. It has some **antispasmodic** effect and is used in whooping-cough, delirium tremens, some forms of insanity, chorea, epilepsy, headache, neuralgia. The derangement of hearing and sight is perhaps due to effect on the nervous system, though some explain the deafness by saying it is due to congestion of the auditory canal, and the

blindness by saying that the vessels in the retina are very much contracted. *Circulation:* The heart is stimulated and vessels contracted by small doses, large doses having the opposite effect; tends to lessen the movements of white blood corpuscles; small doses increase the number and very large doses destroy them. Red corpuscles are said to be rendered smaller, but this is probably incorrect or at least not due to direct effect of quinine; the ozonizing power of blood is prevented by quinine and the oxyhemoglobin is less easily broken up, consequently oxidation is interfered with; the number of red corpuscles is increased by small doses. *Respiration:* Slightly stimulated by small doses and depressed by large ones. Quinine is used to abort a winter cold, but is of slight benefit in breaking it up. *Kidneys:* Urine is sometimes increased; uric acid and urea are diminished, showing a lessened breaking down of nitrogenous tissue. Quinine is largely eliminated in the urine unchanged. *Uterus:* Quinine is said to produce abortion and to increase the menstrual flow; this is disputed and the variation may be due to idiosyncrasy. Some physicians recommend it highly as an aid to contraction in cases of labor and for preventing postpartum hemorrhage; emmenagogue in anemia. *Metabolism:* Lessened so far as nitrogenous matter is concerned, though the carbon dioxide exhaled is not diminished. *Temperature:* Not affected in health by medicinal doses. In fever it is lowered, perhaps due to lessened metabolism, depression of the thermogenetic centre, or to the destruction of the agent producing the fever. It is best given in large doses one or two hours before the fever ordinarily begins to fall. It is slower than the coal-tar products; its effect lasts longer, causes less depression but worse after-effects. It is chiefly used as **antipyretic** for malarial fever, but also used some in typhoid fever, variola, pneumonia, acute rheumatism, septicemia, pyemia, measles, scarlet fever, erysipelas. It is **antiperiodic** and **specific** in malaria, killing the plasmodium which causes the disease, acting more effectively upon the germ in its ameboid stage. For some time after the malaria is broken up quinine should be given every sixth or seventh day. It is also used as a **prophylactic** by persons going into a malarial district, taken in small doses daily or

in larger doses weekly. The spleen, which during the attack of malaria is enlarged, is reduced under the influence of quinine. Considerable idiosyncrasy exists. Care should be taken in giving quinine to persons having acute ear trouble, gastro-intestinal irritation, or idiosyncrasy. In large doses quinine produces symptoms known as cinchonism; a fulness of the head, headache, tinnitus, vertigo, staggering gait, deafness, impaired vision, eruption, delirium, and coma; sight and hearing are rarely permanently injured. To relieve these symptoms hydrobromic acid or one of the bromides should be given. Quinine is well given in capsules or cachets; aromatic syrup of yerba santa or fluidextract of licorice will disguise the taste well.

Preparations and Doses.—Fluidextract, 10 to 60 ♏ (0.6 to 4 Cc.). Tincture and Compound tincture, ½ to 2 ℥ (2 to 8 Cc.). Quinine, Quinine hydrobromide, hydrochloride, bisulphate, sulphate, and salicylate, ½ to 2 gr. (0.03 to 0.12 Gm.) as tonic; 4 to 20 gr. (0.25 to 1.3 Gm.) as antiperiodic. Quinidine sulphate, Cinchonidine sulphate, Cinchonine sulphate, 1 to 30 gr. (0.06 to 2 Gm.). Quinine is an ingredient in the Elixir and the Glycerite of iron, quinine, and strychnine phosphates, Iron and quinine citrate, Soluble iron and quinine citrate, Compound syrup of hypophosphites.

REMIJIA.*

Synonyms.—Cuprea bark, Copper-colored cinchona.

Botanical Names.—Re-mij′-i-a pe-dun-cu-la′-ta. R. Purdi-e-a′-na. *Natural Order:* Rubiaceæ. *Habitat:* South America.

Part Used.—Bark.

Description.—Quills or curved pieces or small fragments, corrugated or warty cork more or less removed, showing the copper-red interior; fracture short, hard, heavier than water; odorless; bitter taste. Like cinchona it gives a purplish-red tar when heated.

Active Principles.—Quinine, Cupreine (which can be converted into quinine), Quinidine, Cinchonine.

Used for the manufacture of quinine.

MITCHELLA.*

Synonyms.—Squaw-vine, Partridge-berry, Deer-berry.

Botanical Name.—Mit-chel'-la re'-pens. *Natural Order:* Rubiaceæ. *Habitat:* North America.

Parts Used.—Stem and leaves.

Description.—Stem 6 to 18 in. (15 to 45 Cm.) long, smooth, branching; leaves about ½ in. (12 Mm.) long, roundish ovate, opposite, petioled, entire, dark green, shining; often showing whitish lines; odorless; bitter.

Active Principle.—Saponin-like body.

Action and Uses.—Astringent, diuretic, **emmenagogue,** parturient. Used by the squaws for several weeks before childbirth; not used much in regular medicine.

Dose.—½ to 2 ʒ (2 to 8 Gm.) in strong decoction.

GAMBIR.

Synonyms.—Gambir, Pale catechu.

Botanical Name.—Ou-rou-pa'-ri-a gam'-bir. *Natural Order:* Rubiaceæ. *Habitat:* East Indies.

Parts Used.—Extract from leaves and twigs.

Description.—Irregular masses, or cubes about 1 in. (2.5 Cm.) in diameter; externally reddish brown, pale brownish gray, or light brown; fracture dull earthy, friable, crystalline; inodorous; bitterish, very astringent, with a sweetish after-taste. A decoction is made of the young, leafy shoots and then evaporated.

Active Principle.—Tannin.

Action and Uses.—Similar to tannic acid.

Preparations and Doses.—10 to 30 gr. (0.6 to 2 Gm.). Compound tincture, ½ to 3 ʒ (2 to 12 Cc.). Troches.

VIBURNUM OPULUS.

Synonyms.—Cramp bark, Cranberry tree.

Botanical Name. — Vi-bur'-num op'-u-lus. *Natural Order:* Caprifoliaceæ. *Habitat:* North America.

Part Used.—Bark.

Description.—In somewhat transversely curved pieces, occasionally in quills, of variable length; outer surface grayish brown, longitudinally wrinkled, with large, brown lenticels and brownish-black fruit heads of a lichen; inner surface light brown, longitudinally striate; fracture uneven, fibrous; transverse sections showing several bands of bast fibers; odor slight; taste somewhat astringent and bitter.

Active Principles.—Viburnin, Valeric acid.

Action and Uses.—Similar to black haw, but weaker.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

VIBURNUM PRUNIFOLIUM.

Synonyms.—Black haw, Sheep-berry, Stag-bush.

Botanical Names.—Vi-bur′-num pru-ni-fo′-li-um, V. len-ta′-go. *Natural Order:* Caprifoliaceæ. *Habitat:* North America.

Part Used.—Bark of root. *Adulterants:* Bark of other species.

Description.—In irregular or quilled pieces, rarely exceeding $\frac{1}{6}$ in. (4 Mm.) thick; externally dingy brown, shallowly fissured and slightly scaly; inner surface rust brown; fracture weak, short, and uneven, the inner layer whitish, the middle rust brown, the outer dark brown; groups of stone cells readily distinguishable in transverse section; odor slight, peculiar; taste very bitter, somewhat astringent. Bark from branches or young stems has dark-purple color.

Active Principles.—Viburnin, Valeric acid.

Action and Uses.—Astringent, tonic, diuretic, nervine; chiefly used as **antispasmodic** in nervous diseases of pregnancy to prevent miscarriage, in spasmodic dysmenorrhea, and as **emmenagogue** in menorrhagia and ovarian irritation.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

SAMBUCUS.*

Synonym.—Elder.

Botanical Name.—Sam-bu′-cus can-a-den′-sis. *Natural Order:* Caprifoliaceæ. *Habitat:* North America.

Part Used.—Flowers.

Description.—When fresh or wet about $\frac{1}{5}$ in. (5 Mm.) broad, shrivelled when dry; calyx five-toothed, superior; corolla brownish yellow, wheel-shaped, five-lobed, with five stamens on the short tube; slight, peculiar odor; sweetish, aromatic taste.

Active Principle.—Volatile oil.

Action and Uses.—Mostly confined to domestic practice. **Emollient** in form of poultice for rheumatism, abscesses, or in ointment for burns, eruptions, and skin diseases. Internally it is used as **diaphoretic, diuretic.** Berries are diuretic, laxative, and alterative in rheumatism and syphilis. Inner bark is a hydragogue cathartic.

Dose.—15 to 60 gr. (1 to 4 Gm.).

VALERIANA.

Synonyms.—Valerian; Common, European, or Cat's valerian.

Botanical Name.—Va-le-ri-a′-na of-fi-ci-na′-lis. *Natural Order:* Valerianaceæ. *Habitat:* Europe, Asia, and North America.

Parts Used.—Rhizome and roots. *Adulterants:* Allied species, Veratrum album.

Description.—Rhizome from $\frac{4}{5}$ to $1\frac{3}{5}$ in. (2 to 4 Cm.) long and $\frac{2}{5}$ to $\frac{4}{5}$ in. (1 to 2 Cm.) thick, upright, subglobular or obconical, truncate at both ends, brown or yellowish brown, internally whitish or pale brownish, with a narrow circle of white wood under the thin bark. Roots numerous, slender, brittle, brown, with a thick bark, and slender, ligneous cord; odor peculiar, becoming stronger and more unpleasant on keeping the drug; taste camphoraceous and somewhat bitter.

Active Principles.—Volatile oil, Valeric acid.

Action and Uses.—Similar to other drugs containing a volatile oil, the activity being due to the oil rather than the acid. It is chiefly used as a sedative and **antispasmodic** in reflex irritability, hysteria, epilepsy, chorea, whooping-cough, neurotic conditions. Stimulant to secretions of the alimentary canal and to peristalsis; **carminative** in flatulence of infants; stimulant to secretions of mucous membranes of the respiratory and genito-urinary tracts; cardiac stimulant in syncope and palpitation. The valerates have the effect of the base rather than the acid, but are used some as **nerve sedatives.**

Preparations and Doses.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.). Tincture, and Ammoniated tincture, ¼ to 2 ℥ (1 to 8 Cc.). Oil,* 1 to 5 ♏ (0.06 to 0.3 Cc.).

PEPO.

Synonym.—Pumpkin.

Botanical Name.—Cu-cur′-bi-ta pe′-po. *Natural Order:* Cucurbitaceæ. *Habitat:* Asia, America, cultivated.

Part Used.—Seed.

Description.—Broadly ovate, flat, somewhat biconvex, about ⅘ in. (20 Mm.) long; externally whitish or yellowish white, nearly smooth, with a shallow groove parallel to the margin; seed coat consisting of a white, coriaceous outer layer, and a membranaceous inner layer; embryo whitish, straight, with a conical hypocotyl and two planoconvex cotyledons; slightly odorous when contused; taste bland and oily.

Active Principles.—Resin, Fixed oil.

Action and Uses.—Efficient though not always certain **vermifuge**, without unpleasant symptoms; used against the tapeworm. Should be taken on an empty stomach and followed in a couple of hours by a brisk cathartic.

Dose.—½ to 2 ℥ (15 to 60 Gm.) taken in the form of an emulsion.

COLOCYNTHIS.

Synonyms.—Colocynth, Bitter apple, Bitter gourd.

Botanical Name.—Ci-trul'-lus col-o-cyn'this. *Natural Order:* Cucurbitaceæ. *Habitat:* Mediterranean basin.

Part Used.—Peeled fruit.

Description.—Globular, from 2 to 4 in. (5 to 10 Cm.) in diameter; white or yellowish white, light, spongy, separable longitudinally into three carpels, each containing near the outer surface numerous ovoid, compressed, whitish or light-brown seeds; odor slight; taste intensely bitter. The seeds should be separated and rejected. They are nearly inert and contain a considerable amount of fixed oil. The pulp is about one-third and the seeds two-thirds of the peeled fruit.

Active Principle.—Colocynthin.

Action and Uses.—Irritant to the mucous membranes. In small doses it is a bitter **tonic**, aiding digestion; in very large doses it is a gastro-intestinal irritant. In moderate doses it greatly increases intestinal and biliary secretions and intestinal peristalsis; causes much griping and large, watery stools. Used as a **hydragogue** and **drastic cathartic** in constipation, dropsy, cerebral congestion, paralysis; said to be unsafe in pregnancy, but this is true only in toxic doses probably; has been used to produce abortion, but death has often resulted. In minute doses it is used for ovarian and other neuralgias and sciatica. It is too harsh a drug to be given alone and should be combined with henbane or aromatics. It has some **diuretic** action.

Preparations and Doses.—Extract, $\frac{1}{4}$ to 5 gr. (0.015 to 0.3 Gm.). Compound extract, 2 to 20 gr. (0.12 to 1.3 Gm.). Compound cathartic pills.

ELATERIUM.*

Synonyms.—Elaterium. Of the plant, Squirting or Wild cucumber.

Botanical Name.—Ec-bal'-li-um e-la-te'-ri-um. *Natural Order:* Cucurbitaceæ. *Habitat:* Europe, Asia, Africa.

Part Used.—Deposit from the juice.

Description.—Light, brittle fragments; flat or slightly curved; may show the markings of the paper or muslin upon which it was dried; pale-grayish color, with a tinge of green or yellow; slight odor; very bitter, somewhat acrid taste; was formerly official, but was dropped on account of being so variable. Obtained by collecting the nearly ripe fruit, cutting longitudinally and pressing slightly, allowing the juice to deposit.

Active Principle.—Elaterin (U. S. P.).

Action and Uses.—Elaterin is one of the strongest hydragogue and **drastic purgatives** we have; causes much griping, depression, exhaustion, and prostration. Too violent for ordinary constipation; used in dropsy, ascites, uremia, congestion at base of the brain. Should not be given where there is any irritation of the stomach or intestines.

Preparations and Doses.—$\frac{1}{16}$ to $\frac{1}{2}$ gr. (0.004 to 0.03 Gm.). Elaterin, $\frac{1}{20}$ to $\frac{1}{10}$ gr. (0.003 to 0.006 Gm.). Trituration, $\frac{1}{4}$ to 1 gr. 0.015 to 0.06 Gm.).

BRYONIA.*

Synonyms.—Bryony, Devil's turnip.

Botanical Name.—Bry-o'-ni-a al'-ba. B. di-o-i'-ca. *Natural Order:* Cucurbitaceæ. *Habitat:* Europe.

Part Used.—Root.

Description.—Transverse sections, about 2 in. (5 Cm.) across, and $\frac{1}{8}$ in. (3 Mm.) thick, grayish-brown bark, rough, central portion whitish or grayish; numerous small, projecting wood bundles; short fracture; odorless; bitter, nauseous taste.

Active Principles.—Bryonin, Bryonidin.

Action and Uses.—**Hydragogue cathartic**, used for pleurisy, pericarditis, dropsy, certain forms of constipation; now generally replaced by jalap. It is an irritant to the mucous membrane, tonic, diuretic, emmenagogue, abortifacient. Fresh juice is an irritant and vesicant.

Dose.—10 to 60 gr. (0.6 to 4 Gm.).

LOBELIA.

Synonyms.—Lobelia, Indian tobacco, Wild tobacco, Emetic weed.

Botanical Name.—Lo-be′-li-a in-fla′-ta. *Natural Order:* Campanulaceæ. *Habitat:* North America.

Parts Used.—Leaves and tops.

Description.—Leaves alternate, the lower short petioled, the upper sessile, ovate or oblong, 1½ to 4 in. (4 to 10 Cm.) long, irregularly serrate denticulate, the divisions with a yellowish-brown, gland-like apex; pale green, pubescent; stems coarsely angled, often purplish, hairy, terminating in long racemes of small, short-pedicelled flowers, having an adherent, five-toothed calyx and a small, tubular corolla, cleft to the base on the upper side, the one-sided limb five-lobed, and pale blue in the fresh state, the five stamens united; capsule inflated, two-celled, containing numerous minute, brownish, ellipsoidal, coarsely reticulate seeds; odor slight, irritating; taste strongly acrid. Collected after a portion of the capsules have become inflated.

Active Principle.—Lobeline.

Action and Uses.—An infusion is used locally for poison ivy and epididymitis. It is an **emetic**, but too depressing and unreliable; **purgative** for constipation from atony; **expectorant** for catarrh and bronchial troubles; chiefly used as an **antispasmodic** for spasmodic asthma, croup, whooping-cough, dry cough with tickling sensation, strangulated hernia, intussusception of the bowel; diuretic, diaphoretic. Large doses cause nausea, vomiting, muscular relaxation, respiratory and circulatory depression, prostration; cold, clammy skin; collapse, coma, death.

Preparations and Doses.—Fluidextract, 1 to 5 ♏ (0.06 to 0.3 Cc.) as an expectorant; 10 to 20 ♏ (0.6 to 1.3 Cc.) as emetic. Tincture, 5 to 20 ♏ (0.3 to 1.3 Cc.) as expectorant.

TARAXACUM.

Synonyms.—Dandelion, Lion's tooth, Blow-ball.

Botanical Name.—Ta-rax'-a-cum of-fi-ci-na'-le. *Natural Order:* Compositæ. *Habitat:* North temperate zone.

Part Used.—Root.

Description.—Cylindraceous and tapering very gradually, of variable length, and $\frac{2}{5}$ to $\frac{4}{5}$ in. (1 to 2 Cm.) thick above, crowned with several short, thickish heads, usually simple or somewhat branched, the branches closely parallel; externally blackish brown, longitudinally wrinkled; fracture short, showing a yellowish, porous central axis, surrounded by a thick, whitish bark, containing numerous milk vessels arranged in concentric circles; slight odor; bitter.

Active Principles.—Taraxacin, Resins.

Action and Uses.—Used much more formerly than now. Bitter **tonic** for promoting appetite and digestion; once thought to greatly increase the secretion of bile and was used as a **laxative** in catarrhal jaundice, dyspepsia and constipation due to hepatic torpor, ascites from hepatic diseases; **diuretic** but too feeble to be of benefit.

Preparations and Doses.—Extract, 5 to 30 gr. (0.3 to 2 Gm.). Fluidextract, 1 to 8 ℥ (4 to 30 Cc.).

CICHORIUM.*

Synonyms.—Chicory, Succory, Blue dandelion.

Botanical Name. — Ci-cho'-ri-um in'-ty-bus. *Natural Order:* Compositæ. *Habitat:* Europe, North America.

Part Used.—Root.

Description.—Resembles dandelion, but larger and lighter colored, cylindraceous, tapering, fleshy; nearly odorless; bitter.

Active Principle.—Inulin.

Action and Uses.—Similar to dandelion. Used as an adulterant of coffee.

LACTUCARIUM.

Synonyms.—Acrid lettuce, Wild lettuce, Prickly lettuce. *Botanical Name.*—Lac-tu'-ca vi-ro'-sa. *Natural Order:* Compositæ. *Habitat:* Europe, North America.

Part Used.—Concrete milk juice.

Description.—Usually in quarter sections of hemispherical masses, or in irregular, angular pieces; externally dull reddish brown or grayish brown; internally light brown or yellowish, the cut surface having a waxy lustre and somewhat porous; odor distinct, opium-like; taste strongly bitter. Obtained by cutting off the top of the stalk, scraping off the milky exudation and drying by artificial heat; each plant is cut five or six times a day for several weeks and yields less than 1 dr. of dried juice. L. sativa, common garden lettuce, has comparatively little milky juice and is but very feebly hypnotic.

Active Principles.—Lactucin, Lactucic acid, Lactucopicrin.

Action and Uses.—Somewhat similar to opium, but very much weaker; without bad after-effects, but unreliable. Used as a substitute for opium, as a **hypnotic** and sedative for children; as a placebo; as a vehicle in the form of a syrup for expectorants and antispasmodics. Rarely employed now.

Preparations and Doses.—Tincture, 15 to 60 ♏ (1 to 4 Cc.). Syrup, 1 to 4 ℥ (4 to 15 Cc.).

EUPATORIUM.

Synonyms.—Boneset, Thoroughwort, Ague-weed, Feverwort, Sweating-herb.

Botanical Name.—Eu-pa-to'-ri-um per-fo li-a'-tum. *Natural Order:* Compositæ. *Habitat:* North America.

Parts Used.—Leaves and flowering tops.

Description.—Usually occurring in fragments; leaves opposite, the pair united at the base, from 3 to 8 in. (8 to 20 Cm.) long, and $\frac{3}{5}$ to 2 in. (1.5 to 5 Cm.) broad, tapering regularly from near the base to an acute apex, crenate serrate, rugosely

veined, rough and bright green above, yellowish gray green, hairy, and resinous dotted beneath; flower heads small, numerous, corymbed, with a bell-shaped involucre of lance-linear, imbricated scales, and with from ten to fifteen tubular, yellowish-white florets, having a bristly pappus in a single row; odor faintly aromatic; taste strongly bitter.

Active Principle.—Eupatorin.

Action and Uses.—Chiefly in domestic practice. **Tonic** for dyspepsia and general debility; largely used in the form of a hot infusion as a **diaphoretic** to abort colds, sore throat, bronchitis, catarrh, influenza, muscular rheumatism; **antiperiodic** for intermittent fever; supposed to relieve the pain of dengue. In large doses it is emetic, laxative, and diuretic.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

GRINDELIA.

Synonyms.—Grindelia, California or Broad-leaved gum-plant.

Botanical Names.—Grin-de'-li-a ro-bus'-ta. G. squar-ro'-sa. *Natural Order:* Compositæ. *Habitat:* North America.

Parts Used.—Leaves and flowering tops.

Description.—Leaves about 2 in. (5 Cm.) or less long, oblanceolate, lanceolate, sessile, obtuse, more or less sharply serrate, often spinosely toothed; pale green, smooth, finely dotted, somewhat coriaceous, brittle; heads more or less resinous viscid, many flowered, either conical urn shaped (*G. squarrosa*), or depressed (*G. robusta*); the involucre hemispherical, composed of numerous imbricated, squarrosely tipped or spreading scales; ray florets yellow, ligulate, pistillate, sometimes absent; disk florets yellow, tubular, perfect; pappus of two or three mostly unequal awns about the length of the disk florets; odor balsamic; taste pungently aromatic and bitter. Grindelia robusta was first introduced, but is now very rare and the G. squarrosa is what is almost always supplied, frequently under the name of the other species

Active Principles.—Resin, Bitter principle.

Action and Uses.—The fluidextract diluted with water is applied locally to relieve the pain of burns, blisters, ulcers,

iritis, poison ivy, shingles. It is eliminated through the mucous membranes of the respiratory and genito-urinary tracts, irritating them, increasing and then diminishing the secretions. It relaxes the muscular coats of the bronchi and is used chiefly as an **antispasmodic** and **expectorant** in asthma, whooping-cough, spasmodic dyspnea, bronchitis, emphysema. It is **diuretic** and is used in chronic cystitis, chronic pyelitis, gonorrhea, gleet, vaginitis. The disagreeable taste may be covered somewhat by chloroform and the fluidextract may be given in milk or mucilage.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

SOLIDAGO.*

Synonyms.—Golden rod, Sweet or Fragrant golden rod.

Botanical Name.—Sol-i-da′-go o-do′-ra. *Natural Order:* Compositæ. *Habitat:* North America.

Parts Used.—Leaves and tops.

Description.—Stem round and smooth; leaves linear lanceolate, broad at base, entire, acute, rough at margins, prominent midrib, small pellucid dots; odor suggesting anise; aromatic, astringent taste.

Active Principle.—Volatile oil.

Action and Uses.—Similar to other drugs containing volatile oils; carminative and antispasmodic.

Dose.—½ to 2 ʒ (2 to 8 Gm.).

ERIGERON.*

Synonyms.—Canada fleabane, Mare's tail, Horse weed.

Botanical Name.—E-rig′-er-on can-a-den′-se. *Natural Order:* Compositæ. *Habitat:* North America.

Part Used.—Flowering herb.

Description.—Stem branching, furrowed, bristly; leaves alternate, linear lanceolate, serrate dentate to entire; flowers very small, numerous, white.

Active Principle.—Volatile oil (U. S. P.).

Action and Uses.—The oil is similar to oil of turpentine, but less irritating, less active, less disagreeable taste. Applied externally to prevent the bites of insects; **astringent** in diarrhea and dysentery; hemostatic in passive hemorrhages from nose or intestines; substitute for copaiba in gonorrhea; diaphoretic, expectorant.

Dose.—Oil, 5 to 30 ♏ (0.3 to 2 Cc.).

GNAPHALIUM.*

Synonyms.—Life everlasting, Common or sweet life everlasting, White balsam.

Botanical Name.—Gna-pha′-li-um ob-tu-si-fo′-li-um. *Natural Order:* Compositæ. *Habitat:* North America.

Part Used.—Herb.

Description.—Stem branched, whitish, woolly; leaves alternate, sessile, linear lanceolate, acute, entire, rough on top, hairy beneath; flowers tubular, yellow, in heads.

Active Principles.—Volatile oil, Bitter principle.

Action and Uses.—Leaves are chewed for ulceration of the mouth and throat. Hot infusion is a **diaphoretic,** used in quinsy and pulmonary complaints; as a **poultice** for bruises and ulcers; stomachic, soothing expectorant.

Dose.—15 to 60 gr. (1 to 4 Gm.).

INULA.*

Synonyms.—Elecampane, Wild sunflower, Elf-dock.

Botanical Name.—In′-u-la he-le′-ni-um. *Natural Order:* Compositæ. *Habitat:* Europe, Asia, North America.

Part Used.—Root.

Description.—Crooked, generally in longitudinal slices, or transverse concave segments, edges curving slightly, wrinkled, flexible in damp weather, short fracture when dry, brown outside, yellowish or gray inside; dotted with shining, yellowish-brown resin cells; odor aromatic, suggestive of lead pencils; taste bitter and pungent.

Active Principles.—Helenin, Inulin, Volatile oil.

Action and Uses.—Used more formerly than now. Rubefacient for skin diseases; **tonic** for dyspepsia; **diuretic** for dropsy; expectorant for catarrh and diseases of the lungs; emmenagogue for amenorrhea, diaphoretic, stimulant.

Dose.—15 to 60 gr. (1 to 4 Gm.).

CALENDULA.

Synonyms.—Marigold, Mary-bud, Holigold.

Botanical Name.—Ca-len′-du-la of-fi-ci-na′-lis. *Natural Order:* Compositæ. *Habitat:* Europe, Asia, cultivated.

Part Used.—Ligulate florets. *Adulterants:* Inferior pale-colored florets, florets of Tagetes erecta and T. patula, which are known as African or French marigold (distinguished by having a scaly pappus).

Description.—Florets, $\frac{3}{5}$ to 1 in. (15 to 25 Mm.) long, yellow or orange colored, one to three toothed, the short, hairy tube occasionally enclosing the remnants of a filiform style and bifid stigma; odor slight and somewhat heavy; taste slightly bitter and faintly saline. The cultivated flowers are double and preferred to the single wild flowers.

Active Principles.—Volatile oil, Calendulin.

Action and Uses.—Considered by many to be valueless. Chiefly used externally as a stimulating **irritant** to aid the healing of wounds, sprains, burns, ulcers, cancers. Has been used as tonic, carminative, antispasmodic, emmenagogue, sudorific, anthelmintic.

Preparations and Doses.—10 to 30 gr. (0.6 to 2 Gm.). Tincture.

ANTHEMIS.

Synonyms.—Chamomile, Roman, Garden, or White chamomile.

Botanical Name.—An′-the-mis no′-bil-is. *Natural Order:* Compositæ. *Habitat:* Europe, North America.

Part Used.—Flower heads from cultivated plants. *Adulterants:* Chrysanthemum parthenium (Feverfew), Anthemis arvensis (corn chamomile), Anthemis cotula (May weed, Dog's fennel). Distinguished by their single circle of ray florets, except Chrysanthemum.

Description.—Subglobular, $\frac{3}{5}$ to $\frac{4}{5}$ in. (1.5 to 2 Cm.) broad, consisting of an imbricated involucre and numerous white, strap-shaped, obscurely three-toothed ray florets, and usually a few tubular disk florets, inserted upon a chaffy, conical, solid receptacle; odor agreeable; taste strongly aromatic and bitter. U. S. P. specifies cultivated flowers so as to get the double flowers, which are more aromatic and pleasant.

Active Principles.—Volatile oil, Anthemic acid.

Action and Uses.—Similar to other drugs containing volatile oils. Chiefly used in domestic practice. Oil is somewhat sedative and has been combined with other remedies for erysipelas, eczema, and erythema. Aids digestion, **stomachic** for dyspepsia; **carminative** for colic in children; diaphoretic for colds; **antispasmodic** for asthma, whooping-cough, reflex coughs; depresses reflex excitability of spinal cord and suggested as a remedy in strychnine poisoning; emetic in large doses.

Doses.—$\frac{1}{2}$ to 1 ʒ (2 to 4 Gm.). Oil,* 1 to 5 ♏ (0.06 to 0.3 Cc.).

MATRICARIA.

Synonyms.—Chamomile, German or Wild Chamomile.

Botanical Name.—Mat-ri-ca'-ri-a cham-o-mil'-la. *Natural Order:* Compositæ. *Habitat:* Europe, Asia, North America.

Part Used.—Flower heads. *Adulterants:* Corn chamomile and May weed, which have solid, chaffy receptacles.

Description.—About $\frac{1}{4}$ to $\frac{1}{3}$ in. (6 or 8 Mm.) broad, exclusive of the rays, with a flattish, imbricated involucre, a conical, hollow, and naked receptacle, ten to twenty white ligulate and reflexed pistillate ray florets, which are about $\frac{1}{3}$ in. (8 Mm.) long, and numerous yellow, tubular, perfect disk florets without pappus; odor somewhat disagreeably aromatic; taste strongly aromatic and bitter.

Active Principles.—Volatile oil, Anthemic acid.

Action and Uses.—Similar to anthemis, but less agreeable.

Doses.—2 to 8 ʒ (8 to 30 Gm.). Oil,* 1 to 5 ♏ (0.06 to 0.3 Cc.).

ACHILLEA.*

Synonyms.—Yarrow, Milfoil.

Botanical Name.—A-chil-le′-a mil-le-fo′-li-um. *Natural Order:* Compositæ. *Habitat:* Europe, Asia, North America.

Parts Used.—Leaves and flowering tops.

Description.—Stem branching at the top, furrowed, hairy; leaves one-third as broad as long, lanceolate, two or three times pinnatified, divisions linear and toothed, glandular beneath, often broken; flowers in a flat-top, corymbose head, each having four or five pistillate ray florets and greenish-white disk florets, receptacle flat and chaffy; odor aromatic, suggestive of chamomile; taste aromatic, bitter, astringent.

Active Principles.—Achilleine, Volatile oil.

Action and Uses.—Known and used by the ancients, rarely used now. Similar to anthemis.

Dose.—15 to 60 gr. (1 to 4 Gm.).

PYRETHRUM.

Synonym.—Pellitory.

Botanical Name.—An-a-cy′-clus py-re′-thrum. *Natural Order:* Compositæ. *Habitat:* Africa, Europe.

Part Used.—Root.

Description.—Somewhat fusiform, nearly simple, 2 to 4 in. (5 to 10 Cm.) long, $\frac{1}{8}$ to $\frac{4}{5}$ in. (3 to 20 Mm.) in diameter; externally dark brown or grayish brown, longitudinally wrinkled and somewhat furrowed, crown somewhat annulate and sometimes tufted with coarse fibers or with soft, woolly hairs; fracture short; bark dark brown, resinous, closely adhering to the light-yellow, radiate, porous wood; odor distinct; taste pungent, very acrid.

Active Principles.—Pyrethrine, Acrid resin.

Action and Uses. — Rubefacient, sternutatory, used in chronic catarrh. Produces a prickling, burning sensation on the tongue and mouth, increasing the secretion of saliva, then numbness; used as **masticatory** in paralysis of the tongue, rheumatic and neuralgic conditions of the face; **sialagogue** to aid the removal of iodine in chronic iodine poisoning; **anesthetic** for an aching tooth. Not used internally.

PYRETHRI FLORES.*

Synonyms.—Pyrethrum flowers, Insect powder. (1) and (2) Persian, Caucasian, or Blue insect powder. (3) Dalmatian or White insect powder.

Botanical Name.—(1) Chrys-an′-the-mum ro-se′-um. (2) C. mar′-schal-li. (3) C. cin-e-ra-ri-æ-fo′-li-um. *Natural Order:* Compositæ. *Habitat:* Asia, cultivated in Africa and North America.

Part Used. — Half-expanded flower heads. *Adulterants:* Old heads, stems, other daisies, quassia, quillaja. Powder is generally adulterated.

Description.—The Dalmatian powder is of a greenish-yellow color; aromatic, somewhat tea-like odor; bitter taste. The Persian is darker. Flowers from plants three to five years old are the best. Should be kept in tight containers, as it loses its activity on exposure.

Active Principles.—Not definitely known. Resin and Volatile oil have been thought to be the principles.

Action and Uses.—Used only as **insecticide**. Not poisonous to man, but is to insects that infest the bodies of man and animals, and houses. Generally used by spraying the powder, but burning seems to be as effective.

TANACETUM.*

Synonyms.—Tansy, Bitter-buttons, Hind-heel.

Botanical Name. — Tan-a-ce′-tum vul-ga′-re. *Natural Order:* Compositæ. *Habitat:* Europe, Asia, North America.

Parts Used.—Leaves and tops.

Description.—Stem angular, reddish or purple; leaves opposite, about 6 in. long and one-half as broad, bipinnatified, the segments oblong, serrate or incised, smooth, dark green; flower heads corymbose, overlapping bracts; convex, naked receptacle; numerous yellow, tubular florets; aromatic, characteristic odor; bitter, pungent taste.

Active Principles.—Volatile oil, Tanacetin.

Action and Uses.—Used more in domestic than regular practice. Locally for bruises and sprains; reputation of being an **abortifacient** in large doses, but often fails and is dangerous to life; **emmenagogue** to restore the menstrual flow; **anthelmintic** against the round-worm; aromatic, bitter, irritant narcotic, diuretic, febrifuge.

Doses.—15 to 60 gr. (1 to 4 Gm.). Oil, 1 to 5 ♏ (0.06 to 0.3 Cc.).

SANTONICA.

Synonyms.—Levant wormseed, Turkestan wormseed.

Botanical Name.—Ar-te-mis′-i-a pau-ci-flo′-ra. *Natural Order:* Compositæ. *Habitat:* Asia, Europe.

Part Used.—Unexpanded flower heads.

Description.—Heads $\frac{1}{12}$ to $\frac{1}{6}$ in. (2 to 4 Mm.) long, oblong ovoid, slightly flattened, obtuse, consisting of an involucre of about twelve to eighteen closely imbricated, glandular scales with broad midribs, enclosing four or five rudimentary florets. Santonica has the appearance of a granular, yellowish-green or greenish-brown, somewhat glossy powder; odor strong, peculiar, somewhat camphoraceous; taste aromatic and bitter.

Active Principles.—Santonin, Volatile oil.

Action and Uses.—Santonin is a **vermicide** for round-worms; also thread-worms when given in form of suppository; but little or no effect on tape-worms. It should be given on an empty stomach and with or then followed by a purgative, as calomel, and a saline cathartic. Sodium santoninate is too soluble and irritating. It has been used to restore vision in diseases of the optic nerve, in incontinence of urine. It imparts a greenish-yellow color to the urine, but purplish red if

urine is alkaline. Large doses cause nausea, vomiting, muscular twitchings, vertigo, slow respiration and pulse, stupor, convulsions. Objects may have a yellow appearance or sometimes red, green, or blue. 2 gr. killed a child.

Preparations and Doses.—Santonin, $\frac{1}{4}$ to $\frac{1}{2}$ gr. (0.015 to 0.03 Gm.) for a child; 1 to 4 gr. (0.06 to 0.25 Gm.) for an adult. Troches.

ABSINTHIUM.*

Synonyms.—Wormwood, Mingwort.

Botanical Name.—Ar-te-mis′-ia ab-sin′-thi-um. *Natural Order:* Compositæ. *Habitat:* Temperate and subtropical countries.

Parts Used.—Leaves and tops.

Description.—Leaves about 2 in. (5 Cm.) long, hoary, silky, pubescent, petiolate, roundish triangular, pinnately two or three cleft, with the segments oblong to obovate, toothed or entire; bracts three-cleft or entire; flowers in heads, racemose, subglobose, small, pale-yellow florets, which are tubular and without pappus; receptacle convex and hairy; odor aromatic, characteristic; taste intensely and persistently bitter.

Active Principles.—Volatile oil, Absinthiin.

Action and Uses.—Bitter **stomachic** for atony of the stomach and intestines; local **anodyne** for rheumatism and neuralgia; **anthelmintic** for round-worms; narcotic poison in large doses, producing headache, tremors, hallucinations, epileptiform convulsions. Absinthe, the French liqueur, is an alcoholic extract with aromatics and produces more injury than alcoholic drinks on account of the oil of wormwood.

Dose.—15 to 45 gr. (1 to 3 Gm.) in form of an infusion.

ARNICA.

Synonyms.—Leopard's bane, Wolf's bane, Mountain tobacco.

Botanical Name.—Ar′-ni-ca mon-ta′-na. *Natural Order:* Compositæ. *Habitat:* Europe, Asia.

Part Used.—Flower heads. *Adulterants:* Flowers of different plants of the Compositæ. Frequently adulterated.

Description.—Subglobular, about $\frac{4}{5}$ in. (2 Cm.) long; bracts bell-shaped, in 1 to 2 ranks, oblong, dark green, pubescent; receptacle slightly convex, deeply pitted, densely short hairy; rays about sixteen, bright yellow, three-toothed, seven to nine nerved, pistillate; disk flowers perfect, five-toothed, of a deeper yellow, their akenes slender, tapering sharply to the base, flattened, five-ribbed, pubescent, the pappus nearly a half longer than the akene, of a single circle of nearly white bristles; odor characteristic and agreeable; taste bitter.

Rhizome and roots were official in 1890. Rhizome about 2 in. (5 Cm.) long, about $\frac{1}{8}$ in. (3 Mm.) thick, rough from leaf scars, sometimes having hairy remains of petioles, brown outside, whitish inside, bark rather thick and containing a circle of resin cells, surrounding yellowish wood wedges, pith thick; roots numerous and easily broken, lighter color than rhizome, thick bark; odor somewhat aromatic; taste pungent and bitter.

Active Principles.—Arnicin, Volatile oil.

Action and Uses.—External: **Irritant**, produces a feeling of warmth and on delicate skin of some persons may cause eruption and pustules; used for bruises, sprains, various inflammations, boils, abscesses, eczema, erysipelas, rheumatism, epistaxis, to promote rapid healing of cuts. *Internal:* Used for exhausting diarrhea, internal bruises, ecchymoses, hemoptysis, gout, rheumatism, delirium tremens. It is a sternutatory, cardiac stimulant and depressant, stomachic, carminative, diuretic, emmenagogue. The irritating properties are said to be due to the eggs and larvæ of an insect. This insect does not trouble the roots, so that preparations from the roots are better for internal administration. Large doses produce symptoms of an irritant.

Preparation and Dose.—Tincture, 15 to 30 ♏ (1 to 2 Cc.).

LAPPA.

Synonyms.—Burdock, Beggars' buttons, Clotbur, Hareburr.

Botanical Name.—Arc-'ti-um lap'-pa or other species. *Natural Order:* Compositæ. *Habitat:* Temperate zone.

Part Used.—Root from first year's growth.

Description.—Nearly simple, fusiform, of variable length, $\frac{1}{5}$ to $\frac{4}{5}$ in. (5 to 20 Mm.) in diameter near the crown, frequently split or in broken pieces; externally grayish brown, longitudinally wrinkled, the crown somewhat annulate, sometimes surmounted by a woolly tuft of leaf remains; fracture somewhat horny; a dark cambium separating the thick, brownish bark from the yellowish, porous, and radiate wood; centrally hollow or containing a white, pith-like tissue; odor slight; taste mucilaginous, sweetish, and slightly bitter. Quite liable to be wormy or moldy.

Active Principles.—Inulin, Bitter principle.

Action and Uses.—Applied externally for swellings, hemorrhoids, burns, wounds, chronic sores. Internally it is chiefly given as an **alterative** for gout, rheumatism, syphilis, scrofula, and chronic skin diseases. It is also diuretic, diaphoretic, aperient. Burdock fruit has been used as a substitute for the root.

Preparation and Dose.—Fluidextract, 15 to 60 ♏ (1 to 4 Cc.).

CARTHAMUS.*

Synonyms.—Safflower, False or Dyer's saffron.

Botanical Name.—Car'-tha-mus tinc-to'ri-us. *Natural Order:* Compositæ. *Habitat:* Asia, Europe, North America.

Part Used.—Florets.

Description.—About 1 in. (2.5 Cm.) long, corolla slender and tubular, deeply five-lobed, lobes lanceolate, orange red; style long, protruding two-cleft, yellowish; characteristic aromatic odor; bitter taste.

Active Principles.—Carthamin, Safflower yellow.

Action and Uses.—Similar to saffron; diaphoretic. Used only in domestic practice to promote the eruption in some skin diseases.

Dose.—5 to 30 gr. (0.3 to 2 Gm.) in infusion.

HELIANTHUS.*

Synonym.—Sunflower.

Botanical Name.—He-li-an'-thus an'-nu-us. *Natural Order:* Compositæ. *Habitat:* America.

Part Used.—Seed.

Description.—Somewhat quadrangular, apex somewhat pointed, whitish to black or striped, whitish inside; odorless; oily taste.

Active Principle.—Fixed oil.

Action and Uses.—In making poultices, as a food for animals; the oil is used as a substitute and adulterant for olive and other oils.

CARDUUS.*

Synonyms.—Blessed, Holy, or Cursed thistle.

Botanical Name.—Cni'-cus ben-e-dic'-tus. *Natural Order:* Compositæ. *Habitat:* Europe.

Parts Used.—Leaves and flowering tops.

Description.—Leaves opposite, lanceovate, entire to deeply pinnatified, hairy, decurrent, grayish green; flowers yellow, terminal heads; involucral scales hard and horny, terminating in a spine; unpleasant odor; bitter taste.

Active Principle.—Cnicin.

Action and Uses.—**Tonic** for dyspepsia; emmenagogue for suppressed menstruation; diaphoretic for colds.

Dose.—15 to 60 gr. (1 to 4 Gm.).

TUSSILAGO.*

Synonyms.—Coltsfoot, Horse-hoof.

Botanical Name.—Tus-si-la'-go far-far'-a. *Natural Order:* Compositæ. *Habitat:* Europe, Asia.

Parts Used.—Leaves and flowers.

Description.—Leaves heart-shaped, slightly lobed, sharply toothed, smooth and green above, white and densely hairy beneath, prominent veins; flower heads appear before the leaves, single, smaller than the dandelion; odorless; bitter.

Active Principle.—Bitter principle.

Action and Uses.—Tonic, **demulcent** in bronchial troubles; chiefly used in domestic practice.

Dose.—15 to 60 gr. (1 to 4 Gm.).

PAPAIN.*

Synonyms.—Papayotin, Caricin.

Botanical Name.—Car'-i-ca pa-pa'-ya. (Papaw or Melon tree). *Natural Order:* Papayaceæ. *Habitat:* Tropical America.

Part Used.—An impure ferment obtained from the milky juice of the nearly ripe fruit.

Description.—A whitish powder, nearly odorless and tasteless; soluble in water, but not in alcohol; its activity is destroyed at about 82° C. Several trade-names are given it, as Papoid and Caroid.

Action and Uses.—Action is similar to pepsin, transforming albuminous matter into albumoses and peptones; acts in acid, alkaline or neutral solutions, best in alkaline; inferior to pepsin and much inferior to pancreatin. Used in indigestion and also as an anthelmintic; has been used to digest the false membrane in diphtheria.

Bromelin is a ferment obtained from the juice of the pineapple (Ananas sativus). Resembles trypsin rather than pepsin in action; converts albumin into albumoses and peptones; acts in acid, alkaline, or neutral solution; best when neutral. The juice of pineapples tends to cause abortion, particularly if the apples are green.

Preparations and Doses.—Papain, 2 to 5 gr. (0.02 to 0.3 Gm.). Pineapple juice, ½ to 1 ℥ (15 to 30 Cc.).

ANIMAL DRUGS.

COCCUS.

Synonym.—Cochineal.

Zoological Name.—Pseu-do-coc'-cus cac'-ti. *Order:* Hemiptera. *Habitat:* Mexico, Central America.

Part Used.—Dried female insect. *Adulterants:* Exhausted cochineal which has been artificially colored with rosaniline; heavy mineral matter, which can usually be detected by putting into water, when it separates.

Description.—About $\frac{1}{5}$ in. (5 Mm.) long, somewhat oblong and angular in outline, flat and concave beneath, convex above, externally purplish gray or purplish black; transversely wrinkled, easily pulverizable, yielding a dark-red powder; odor faint; taste slightly bitter. Only the females are recognized by the U. S. P. They are about twice the size of the males and do not have wings. Obtained by shaking from the trees and killing by means of sulphur fumes or other substances, which method yields the "silver grain;" or killing by dipping into boiling water, which yields the "black grain," the wax on the bodies being removed. Commercial carmine is an insoluble compound of carminic acid and alum, potassium acid oxalate, cream of tartar, or other substances; it is soluble in ammonia.

Active Principle.—Carminic acid.

Action and Uses.—Rarely used now in medicine except as a coloring agent and indicator; formerly used as an anodyne in whooping-cough, hiccough, and neuralgia.

CANTHARIS.

Synonyms.—Cantharides, Spanish flies, blister beetles.

Zoological Name.—Can-thar′-is ves-i-ca-to′-ri-a. *Order:* Coleoptera. *Habitat:* Europe, Asia.

Part Used.—Dried beetle. *Adulterants:* Other beetles, exhausted flies.

Description.—From ¾ to 1 in. (18 to 25 Mm.) long, about ¼ in. (6 Mm.) broad; flattish cylindrical, with filiform antennæ; black in the upper part, with two long wing sheaths, and ample membranous, transparent, brownish wings; elsewhere of a shining, coppery-green color; odor strong and disagreeable; taste slight, afterward acrid.

Obtained by beating or shaking the trees, catching the beetles on sheets and killing them by plunging into hot water or by chloroform, carbon disulphide, or other substance. They should be kept well dried in close containers or protected by chloroform vapor. The Russian beetles are larger than those from Southern Europe.

Active Principle.—Cantharidin.

Action and Uses.—External: Action is slow, taking two to three hours to produce tingling and burning and three to five hours to produce a blister. Cantharides should be removed as soon as a blister is formed to prevent absorption of cantharidin; a poultice may then be applied to increase the blister. Its action is more superficial, less penetrating, less painful than mustard. Used chiefly as a **stimulant, irritant,** and **counterirritant** to relieve neuralgia, sciatica, stomach disorders, rheumatism, pericarditis, pneumonia, and in cases where a lasting counterirritant is desired; used as a **vesicant** to raise the skin for skin grafting; common ingredient in hair renewers. Applied to a broken skin it may be absorbed and cause systemic effects. *Alimentary canal:* Except in minute doses, it has a similar irritating and vesicating effect. *Genito-urinary tract*: Causes irritation, increased urine, and in larger doses, albuminuria, hematuria, strangury, priapism, and nephritis. Used in small doses as a stimulant in incontinence of urine, chronic cystitis, spermatorrhea; **emmenagogue** in

scanty menstruation; **aphrodisiac** in impotence. *Toxicology:* Toxic doses cause ptyalism, constriction of throat, nausea, vomiting, great abdominal tenderness and pain, strangury, slowed heart, depressed respiration, lowered temperature, convulsions, coma, death. In treating, empty the stomach with pump or tube; give albuminous or starchy demulcents, but no oils or fats, as these aid the solution and the absorption of cantharidin; opium to relieve pain, stimulants if necessary.

Preparations and Doses.—Tincture, 1 to 10 ♏ (0.06 to 0.6 Cc.). Cerate, Collodion.

1. CERA FLAVA. 2. CERA ALBA. 3. MEL.

Synonyms.—(1) Yellow wax. (2) White wax. (3) Honey.

Zoological Name.—A′-pis mel-lif′-er-a. *Order:* Hymenoptera. *Habitat:* North America, Europe.

Parts Used.—Secretions. *Adulterants:* Of wax; fats, resins, soap, paraffin, other waxes. Of honey; glucose, sugar.

Description.—Yellow Wax: Yellowish to brownish-yellow solid, somewhat brittle when cold; dull, non-crystalline fracture; plastic at body temperature, lighter than water, honey-like odor; faint, balsamic taste. Wax is secreted between the rings of the insect's body. Obtained by draining off the honey, melting the wax with hot water to separate from impurities.

White Wax: Yellowish-white solid, somewhat translucent in thin layers; faint odor; nearly tasteless. Obtained by bleaching yellow wax; yellow wax is converted into thin sheets, subjected to sunlight and moisture for some time, repeating the operation. That bleached by chemicals, as chlorine, is inferior. White wax is not as antiseptic as yellow wax.

Honey: Syrupy liquid, light yellowish to yellowish brown, translucent, gradually becoming opaque and crystalline; characteristic odor; sweet taste. Purified honey is made by mixing honey with paper pulp, heating, straining, and preserving with glycerin.

Active Principles.—Of wax: Myricin, Cerin. Of honey: Sugars.

Action and Uses.—Of wax: **Protective** and hardening agent for ointments and cerates. Formerly used as a demulcent in diarrhea and dysentery. Of honey: Nutritive, demulcent, increases secretions, largely as a **vehicle** for gargles and astringents; used in dryness of throat, aphthæ, stomatitis; laxative for children.

HIRUDO.*

Synonym.—Leech.

Zoological Names.—San-gui-su'-ga me-di-ci-na'-lis and S. of-fi-ci-na'-lis. *Order:* Annulata. *Habitat:* Europe, North America.

Part Used.—Live animal.

Description.—From 2 to 6 in. (5 to 20 Cm.) long, smooth, roundish or flattened, made up of many rings or folds; tapering toward both ends, one end bearing a large disk by which he fastens on animals and the other end having a small disk in which is the mouth, containing three jaws which make a triangular incision; olive-green color with longitudinal, reddish stripes and black spots. Care is required in keeping them. They should have good water, fresh air, and a uniform temperature. Other varieties than the above may be used. The American leech draws less blood.

Action and Uses.—Used to remove blood from capillaries in the early stages of acute inflammation; less painful than cupping. The amount of blood removed by the leech is from one-eighth to one ounce, and in addition some hemorrhage usually follows its removal. The leech is placed in a small bottle or tube and applied to the previously well-cleansed part; a little milk or blood smeared on makes it bite more readily. It may be made to let go by sprinkling with salt.

SPONGIA.*

Synonym.—Sponge.

Zoological Name. — Spon'-gi-a of-fi-ci-na'-lis. *Order:* Ceratospongiæ. *Habitat:* In nearly all large bodies of salt water.

Part Used.—Framework or skeleton of the animal.

Description.—Many varieties on the market, the best being the Rock Island and Sheepwool. Sponges are obtained by tearing them from rocks with hooks or with the hands, allowing to decompose for a few days, then beating with sticks and washing; some are bleached, but this injures the strength.

Active Principle.—Spongin.

Uses.—As sponge tents to dilate cavities, as pessaries for supports, for cleansing and absorbing liquids.

OS SEPIÆ.*

× *Synonym.*—Cuttlefish bone.

Zoological Name.—Se'-pi-a of-fi-ci-na'-lis. *Order:* Decapoda. *Habitat:* Mediterranean Sea, Atlantic ocean.

Part Used.—Mantle.

Description.—White, flattish, somewhat oval, 5 to 10 in. (12.5 to 25 Cm.) long, hard and smooth outside, porous inside; odorless; tasteless.

Active Principle.—Calcium carbonate.

Uses.—Antacid, and in making tooth-powders.

ICHTHYOCOLLA.*

× *Synonyms.*—Isinglass, Fish glue.

Zoological Name.—A-ci-pen'-ser hu'-so and other species. *Order:* Sturiones. *Habitat:* Black and Caspian Seas.

Part Used.—Swimming bladder (sounds). *Adulterants:* Bladders of other fishes.

Description.—Sheets of a horny or pearly appearance, whitish or yellowish, semitransparent, iridescent, swells in water, tears easily longitudinally; odorless; insipid taste. The Russian isinglass which was formerly official consists of the two inner coats of the swimming bladder. The American isinglass, coming from a different fish, is cheaper, but not so good.

Active Principle.—Gelatin.

Action and Uses.—Used as a **protective** in the form of court plaster; in clarifying liquids; has been used as a nutritive and to aid the digestion of milk by preventing the formation of tough clots.

CETACEUM.

Synonym.—Spermaceti.

Zoological Name.—Phy-se'-ter mac-ro-ceph'-a-lus (sperm whale). *Order:* Cetaceæ. *Habitat:* Pacific and Indian Oceans.

Part Used.—Concrete fatty substance from the head of the sperm whale.

Description.—White, somewhat translucent, slightly unctuous masses of a scaly, crystalline fracture and a pearly lustre, with a very faint odor and a bland, mild taste. It becomes yellowish and rancid on prolonged exposure to air. Obtained from the head of the whale; separated from the oil by draining and pressure.

Active Principle.—Cetyl palmitate.

Action and Uses.—Emollient and protective, and a base for ointments.

AMBRA GRISEA.*

Synonym.—Ambergris.

Part Used.—A morbid product found in the intestine of the sperm whale.

Description.—Irregular masses, varying in size, lighter than water, melts on warming, friable when cold; peculiar, fragrant odor; nearly tasteless.

Action and Uses.—Has been used as an **antispasmodic** for nervous diseases; now used in perfumery.

Dose.—5 to 20 gr. (0.3 to 1.3 Gm.).

OLEUM MORRHUÆ.

Synonyms.—Cod-liver oil, Oleum jecoris aselli.

Zoological Name.—Ga'-dus mor'-rhu-a and other species. *Order:* Teleostia. *Habitat:* Atlantic Ocean.

Part Used.—Oil from fresh livers. *Adulterants:* Oil from seals and other fish.

Description.—See p. 422.

Active Principles.—Olein, Biliary salts, compounds of Iodine, Bromine, and Phosphorus.

Action and Uses.—External: Emollient, but too disagreeable an odor. It may be rubbed in when it cannot be taken by the mouth. *Alimentary canal:* Large doses may cause nausea, purging, and eruption. More readily absorbed and assimilated than most oils; reason for this is not definitely known, but may perhaps be due to some of its constituents or to a partial change that may have taken place in the livers of the fish. **Alterative** and nutritive, used in chronic rheumatism, chronic bronchitis, rickets, scrofula, syphilis, malnutrition, skin and nervous diseases.

Preparations and Doses.—1 to 8 ℥ (4 to 30 Cc.). Emulsion and Emulsion with hypophosphites, 1 to 8 ℥ (4 to 30 Cc.).

1. ALBUMIN OVI.* 2. VITELLUS OVI.*

Synonyms.—(1) White of egg, Egg albumen. (2) Yolk or Yelk of egg.

Zoological Name.—Gal′-lus ban′-ki-va (domestic fowl). *Order:* Gallinæ. *Habitat:* Civilized countries, originally Asia.

Part Used.—Egg.

Description.—Albumen: Translucent, thick, ropy liquid; soluble in water, but coagulated by alcohol; slight odor and taste. The dried albumen occurs in yellowish, amorphous, translucent masses, the evaporation being done at a low temperature. Yelk: Yellow to reddish yellow, viscid liquid; slight odor and taste, consisting of oil suspended in water.

Uses.—Albumen: **Antidote** and **demulcent** for poisoning by metallic salts and other irritants; clarifying agent for liquids; poultice with alum for conjunctivitis, stings of insects; food. Yelk: Food; emulsifying agent.

Ingluvin is a preparation from the chicken's gizzard, formerly used as a digestive ferment. Its activity is due to a

bitter principle and not a ferment. Sometimes given to allay vomiting of pregnancy.

MOSCHUS.

Synonym.—Musk.

Zoological Name.—Mos'-chus mos-chif'-er-us. *Order:* Ruminantia. *Habitat:* Asia.

Part Used.—Secretion from preputial follicles. *Adulterants:* Inferior and artificial musk bags, lead and many other substances.

Description.—Usually in irregular, crumbly, somewhat unctuous grains, dark reddish brown, having a peculiar, penetrating, and persistent odor, and a bitterish taste.

About 10 to 12 per cent. of musk is soluble in alcohol, the solution being light brownish yellow, and on the addition of water becoming slightly turbid; from 50 to 75 per cent. is soluble in water, the solution being deep brown, faintly acid, and strongly odorous.

Musk is derived only from the male deer. The musk bag is smooth and flat on top and hairy beneath; weighs on an average about 400 gr. and will contain on an average 150 gr. of musk. When perfectly dry it has very little odor, but this is developed on moistening. A few grains exposed for years will retain the odor.

Active Principle.—Odorous principle.

Action and Uses.—Formerly used much more than now. **Antispasmodic,** nerve **sedative,** diffusible **stimulant**; used in chorea, whooping-cough, hysterical convulsions, spasmodic croup, typhoid fever; similar to camphor, valerian, and asafetida. Used in perfumery.

Preparations and Doses.—2 to 10 gr. (0.12 to 0.6 Gm.). Tincture, ½ to 2 ℥ (2 to 8 Cc.).

FEL BOVIS.

Synonyms.—Ox-gall, Ox-bile.

Zoological Name.—Bos tau'-rus. *Order:* Ruminantia. *Habitat:* Universal.

Part Used.—Gall.

Description.—Brownish-green or dark-green liquid, somewhat viscid, disagreeable odor and bitter taste. The purified is obtained by partially evaporating gall, adding alcohol, filtering, and evaporating to a pilular consistency.

Active Principles.—Glycocholates and Taurocholates of sodium and potassium, Bile pigments.

Action and Uses.—Only the purified gall is used. Liable to disturb digestion, precipitating pepsin; aids absorption of fat; **tonic** in atonic dyspepsia. Increases flow of bile, **cholagogue** in constipation and jaundice from hepatic torpor. **Antiseptic** in typhoid fever and intestinal fermentation. Vermifuge.

Dose.—Purified, 5 to 15 gr. (0.3 to 1 Gm.).

SACCHARUM LACTIS.

Synonyms.—Sugar of milk, lactose.

Zoological Name, Order, and *Habitat.*—See under Fel bovis, preceding page.

Part Used.—Sugar derived from whey of milk.

Description.—White, hard, crystalline masses, or gritty powder, permanent, soluble in 4.8 parts of water; insoluble in alcohol; odorless; sweetish taste.

Action and Uses.—Chiefly as a **vehicle** and **diluent**; does not ferment in the stomach as readily as cane sugar, consequently used in baby foods and milks. Diuretic in large doses for cardiac dropsy.

Dose.—½ to 2 ℥ (15 to 60 Gm.).

GELATINUM.

Synonym.—Gelatin.

Part Used.—Purified, dried product of hydrolysis of animal tissues.

Description.—Amorphous, more or less translucent sheets or shreds; permanent in dry air; swells in cold water; pale yellow; odorless; insipid taste. Obtained by treating pre-

viously cleaned hoofs, bones, skins, etc., with boiling water, separating foreign matter, cutting the solidified gelatin into sheets or cakes, and drying on netting.

Action and Uses.—External: **Protective** and base for court plaster, capsules, bougies, suppositories, pill coating; in solution as a **styptic** for hemorrhages not controlled by pressure or ligature; detannating agent for liquids. *Internal:* Food, **demulcent**, hemostatic for hemorrhages, as it tends to increase coagulability of blood; sometimes injected hypodermically as a 1 per cent. solution; **antidote** to some metallic salts, iodine and bromine.

1. ADEPS LANÆ. 2. ADEPS LANÆ HYDROSUS.

℞ *Synonyms.*—(1) Wool fat; (2) Hydrous wool fat, Lanolin.

Zoological Name.—O′-vis a′-ri-es (sheep). *Order:* Ruminantia. *Habitat:* Universal.

Part Used.—Fat from wool.

Description.—Wool fat is a light-yellowish, tenacious mass, insoluble in water, but miscible with large amounts of it, sparingly soluble in alcohol, melts at about 40° C.; slight, peculiar odor. Suint, the natural fat which comes from the washings of wool, is treated with a weak alkali, separated in a centrifugal machine, extracted with acetone. The hydrous fat contains about 30 per cent. of water and is of an ointment-like consistency; can be mixed with twice its weight of water.

Active Principle.—Cholesterin.

Action and Uses.—Chiefly as an **emollient** and ointment base. Has the advantage that it does not readily become rancid and is not readily acted upon by chemicals; it is claimed that it and medicinal agents mixed with it are more easily absorbed than lard, but this is questioned.

SEVUM PRÆPARATUM.

℞ *Synonyms.*—Suet, Mutton tallow.

Zoological Name, Order, Habitat.—See under Adeps lanæ.

Part Used.—Internal fat of the abdomen of sheep.

Description.—White, solid fat; becomes rancid on long exposure; insoluble in water or alcohol; nearly odorless; bland taste. Obtained by freeing the fat from adhering membrane, melting, and straining. Beef tallow is very similar, a little different odor; contains a little more palmitin.

Active Principles.—Stearin, Palmitin.

Action and Uses.—Emollient for burns, chapped hands.

GLANDULÆ THYROIDEÆ SICCÆ.

Synonyms.—Desiccated thyroid glands, Dried thyroids.

Zoological Name, Order, Habitat.—See under Adeps lanæ.

Part Used.—Dried, powdered gland, freed from fat.

Description.—Yellowish, amorphous powder; partly soluble in water; slight, peculiar odor and taste. One part represents about five parts of the fresh gland. Obtained from fresh glands, rejecting all abnormal ones, by removing fat and connective tissue, drying at about 36° C.

Active Principle.—Iodothyrin.

Action and Uses.—Alimentary canal: Small doses have but little effect; large doses cause loss of appetite and diarrhea. Has a very marked effect on nutrition, but it is not known how it acts. **Alterative**, of great value in myxedema and cretinism, patients becoming almost normal, but it must be taken frequently and throughout life; of benefit in eczema and chronic skin diseases, goitre, climacteric insanity; as it reduces flesh it has been used in obesity, but it is rather dangerous. *Nervous system:* Not much effect unless taken in excess. *Circulation:* Small doses stimulate and moderate doses depress the heart's action, and the drug must be watched for this; peripheral vessels are dilated, skin becoming flushed and moist. *Kidneys:* Urine is increased. *Metabolism:* Oxidation is greatly increased, as shown by the increased urea, uric acid, and carbon dioxide eliminated. Fat seems to be more affected than proteids and the person becomes emaciated. Taken in large doses for some time nausea and vomiting ensue; also cardiac weakness, dyspnea, progressive emaciation, headache, nervousness, insomnia, tremors, convulsions.

Doses.—Commencing with 1 gr. (0.06 Gm.) the dose is increased to 10 or 15 gr. (0.6 or 1 Gm.) or even higher.

GLANDULÆ SUPRARENALES SICCÆ.

Synonym.—Desiccated suprarenal glands.

Zoological Name, Order, Habitat.—See under Adeps lanæ. Also comes from the ox, Bos taurus.

Part Used.—Dried and powdered suprarenal glands separated from fat.

Description.—Light yellowish-brown, amorphous powder, partly soluble in water, characteristic odor. One part represents about six parts of the fresh gland. Glands are freed from adhering fat, dried, powdered, and further freed from fat by extracting with petroleum benzin. Adrenalin is a yellowish-white powder, combines with acids; solutions are easily oxidized by the air, becoming red and brown.

Active Principle.—Adrenalin.

Action and Uses.—Adrenalin hydrochloride has largely displaced the glands. *Alimentary canal:* But little effect is noted here; probably the digestive processes change the gland and its active principle. *Circulation:* Increases the force of the heart's systole, slows the rate and makes it regular; stimulates the muscular coat of the vessels, but not the nerve centres, greatly increasing blood pressure. One part in 1000 to 10,000 parts of physiological salt solution (0.6 per cent. solution of sodium chloride) applied to a mucous membrane causes it to become shrunken and blanched at once and this may last for one-half to several hours. It also increases the duration of anesthesia of cocaine, though not much of an anesthetic itself. Largely used as astringent and **hemostatic** for bloodless operations on the eyes, ears, nose, and throat; for local hyperemias and hemorrhages; in epistaxis, menorrhagia, coryza, conjunctivitis, vascular relaxation, surgical shock, asthma; highly recommended in hay fever; of benefit in a few cases of Addison's disease. It has sometimes produced ill effects, but not fatal so far as known.

Preparations and Doses.—Dried glands, 3 to 5 gr. (0.18 to 0.3 Gm.). Adrenalin hydrochloride,* $\frac{1}{200}$ to $\frac{1}{100}$ gr. (0.0003 to 0.0006 Gm.).

SERUM ANTIDIPHTHERICUM.

Synonyms.—Antidiphtheric serum, Diphtheria antitoxin.
Zoological Name.—E′-qu-us ca-bal′-lus (horse.)
Part Used.—Fluid from coagulated blood of a horse immunized with diphtheric toxin.
Description.—Yellowish or yellowish-brown liquid, transparent or slightly turbid; odorless or slight odor of the antiseptic used in it; should be kept in sealed tubes at about 4° to 15° C., gradually loses its strength, losing 10 to 20 per cent. in a year. The label should bear the strength expressed in units, the antiseptic and its percentage strength, the date beyond which it will not have the strength indicated on the label.

A pure culture of diphtheria is used to inoculate a beef-tea, which is then placed in an incubator for a time. This liquid is then filtered through an unglazed porcelain which removes the bacteria, leaving in solution, the toxins. A perfectly healthy young horse is injected subcutaneously with a small amount (perhaps 0.1 Cc.) of this solution, the amount depending upon the strength of the toxin solution. Symptoms are produced in the horse similar to those of the early stages in the child. When these symptoms subside, a larger amount is injected and so on until the horse no longer reacts, showing that it is immune; the length of time for immunizing varies with the horse. After about two months or more the blood is tested for its antitoxin strength. If satisfactory from one to three gallons of blood are withdrawn, an antiseptic added and allowed to stand for some time, filtered, tested for antitoxin strength and bottled. Great care is required that all parts of the operation be carried on under aseptic conditions.

Action and Uses.—It is used as a **prophylactic** and **specific** for diphtheria. The tissue already damaged is not repaired by the antitoxin, but the false membrane is prevented from spreading and is loosened. It is better to give small doses of a strong serum than large doses of a weak one, as the serum itself sometimes causes ill effect. A large amount of antitoxin over what

is really necessary does little or no harm. Sometimes eruption and local disturbances are produced, but are probably due to an impure or old serum. Immunity conferred by the antitoxin is only temporary, lasting at most but a few weeks. The immunity unit is generally the amount of antitoxin that will neutralize 100 times the amount of toxin that it takes to kill a guinea-pig of 250 Gm. weight. Formerly the death rate of diphtheria cases was about 50 per cent., but it has been reduced to less than 10 per cent.

Doses.—As a prophylactic, 500 to 1000 units; in early stages of the disease, 1000 to 3000 units; in severe cases 4000 or more units, the dose to be repeated if no signs of improvement within twelve hours.

Tetanus antitoxin is very efficient when used in time, but often the case is so far advanced before medical aid is called or before the case can be diagnosticated that the antitoxin is of comparatively little service. However, the percentage of fatal cases has been reduced by its use. The serum must be fresh and 2½ to 5 ℥ (10 to 20 Cc.) injected every four to twelve hours.

Tuberculosis antitoxin has not sustained the claims made for it and at best is only an adjunct to the regular treatment. Koch's tuberculin, which appeared before tuberculosis antitoxin, has proved very disappointing and is now rarely used except as a diagnostic agent by veterinarians to determine the presence or absence of tuberculosis in cattle.

Antistreptococcus serum has been used with benefit in erysipelas, and several forms of septicemia and pyemia but is not effective against all forms of streptococcus.

Antipneumococcus serum has not been very effective, perhaps due to its low potency. Other antisera, as those for typhoid, cholera, plague, syphilis, dysentery, leprosy, etc., have been used with more or less benefit, but none has proved the valuable agent that the diphtheria antitoxin has.

Hydrophobia is treated by administering the toxin, first in small amounts and then gradually increasing them; the time of treatment is usually about two weeks. Undoubtedly this treatment has saved a good many lives, but on the other hand it has been strongly indicated that the disease has sometimes

been contracted from the treatment and that many of the cases have not been true cases of rabies.

Vaccine, used as a prophylactic against smallpox, is obtained from vesicles on bovine animals as the result of cowpox. Not definitely known whether smallpox and cowpox are due to the same germ.

Some other animal extracts have had a limited use. Orchitic extract (Didymin, Testicular juice), Splenic extract, Brain extract, Bone-marrow extract, Nuclein, Thymus extract, Pituitary extract, Ovarian extract, Pineal extract.

ADEPS.

Synonym.—Lard.

Zoological Name.—Sus scrof'-a. *Order:* Pachydermata. *Habitat:* Universal.

Part Used.—Internal fat of the abdomen of the hog. *Adulterants:* Cotton-seed oil and other fats, water.

Description.—Soft, white, unctuous solid; apt to become rancid unless carefully kept, insoluble in water, nearly insoluble in alcohol; faint odor; bland taste. It should be kept in well-closed vessels in a cool place.

Active Principles.—Olein, Stearin.

Action and Uses.—**Emollient,** used chiefly as a base for ointments, cerates; protective for burns and abraded surfaces.

PEPSINUM.

Synonym.—Pepsin.

Zoological Name, Order, Habitat.—See under Adeps.

Part Used.—A proteolytic ferment or enzyme, obtained from the glandular layer of the fresh stomach of the hog.

Description.—Lustrous, white, or pale-yellow, transparent or translucent scales, or white or cream-colored, amorphous powder; sometimes somewhat hygroscopic; nearly soluble in water, insoluble in alcohol; peculiar odor, but free from offensiveness; slightly acid or saline taste. May be obtained by washing the stomach, scraping off the inner membrane, and

digesting this with the addition of a little hydrochloric acid; to this is added sulphurous acid and the precipitated matter removed; the pepsin is precipitated by the addition of sodium sulphate dissolved by dilute hydrochloric acid, purified in a dialyzer, and the solution evaporated at a low temperature. Pepsin should dissolve 3000 times its weight of freshly prepared egg albumen.

Action and Uses.—Pepsin in acid solution converts proteids into peptones; alkalies prevent this action and render pepsin inert. Pepsin is indicated in cases where there is a deficient amount secreted, as in prolonged sickness, and in some cases of gastric disorders of infants, anemia, chlorosis, gastric ulcer. It is quite frequently given when not needed and it is the hydrochloric acid generally given with the pepsin that benefits. Pepsin is of service in predigesting food when not properly digested in the stomach or when it must be given by the rectum.

Dose.—3 to 15 gr. (0.18 to 1 Gm.).

PANCREATINUM.

Synonym.—Pancreatin.

Zoological Name, Order, Habitat.—See under Adeps and Fel bovis.

Part Used.—Enzymes existing in the pancreas of the hog or ox.

Description.—Cream-colored, amorphous powder, hygroscopic, loses its value on continued exposure, nearly soluble in water, insoluble in alcohol; peculiar odor; meat-like taste. Obtained in various ways, chiefly by extracting the pancreas previously freed from fat with water and evaporating.

Active Principles.—Amylopsin, Myopsin, Trypsin, Steapsin.

Action and Uses.—Amylopsin converts starchy matter into a form of sugar; trypsin converts albuminoids into peptones; steapsin emulsifies fats. The action is injured by acids, consequently it is often given with sodium bicarbonate to neutralize the acid in the stomach. It should be given two or three

hours after a meal, when the food has passed into the intestine. It should not be given with pepsin, as the acid with which pepsin is given destroys it and the pepsin digests it; if the two are given together with an alkali the activity of pepsin is destroyed; pepsin should be given with or just after a meal. Pancreatin is used in cases of gastro-intestinal indigestion; frequently for predigesting food, as milk, beef, oysters.

Dose.—5 to 15 gr. (0.3 to 1 Gm.).

ACIDS.

ACIDUM BENZOICUM.

Synonyms.—Benzoic acid, Flowers of benzoin. *Formula:* $HC_7H_5O_2$.

Source.—(1) From benzoin by sublimation or by dissolving in milk of lime and precipitating. (2) Largely from toluene by synthesis. (3) From hippuric acid, which is obtained from urine of horses and cattle.

Description.—White or yellowish-white, lustrous scales, or friable needles, somewhat volatile; light causes it to become yellow, soluble in 281 parts of water and 1.8 of alcohol; acid obtained from toluene is odorless, from benzoin has the odor of benzoin, from hippuric acid has the odor of fetid urine; taste is acid and pungent.

Action and Uses.—External: Similar to benzoin and as an **antiseptic** for foods. *Alimentary canal:* Similar to salicylic acid. *Elimination:* Through skin and mucous membranes of respiratory and genito-urinary tracts, stimulating and disinfecting them. It is chiefly used because it increases the flow and makes the **urine acid**, being excreted as hippuric acid; used in cystitis due to alkaline urine, in phosphatic calculi, Bright's disease, incontinence of urine, albuminuria, gout and gouty conditions, rheumatism. It is used as an **expectorant** in phthisis and other respiratory diseases. The sodium salt is more soluble and generally preferred. Lithium benzoate is sometimes used in gout.

CINNAMIC ACID* has been used hypodermically in treatment of phthisis.

Preparations and Doses.—Benzoic acid, 5 to 15 gr. (0.3 to 1 Gm.). Sodium cinnamate, $\frac{1}{60}$ to $\frac{1}{4}$ gr. (0.001 to 0.015 Gm.) by hypodermic injection.

ACIDUM BORICUM.

Synonyms.—Boric acid, Boracic acid. *Formula:* H_3BO_3.

Source.—Found in nature and obtained from borax by the addition of an acid.

Description.—Colorless scales, somewhat pearly lustre; or six-sided, triclinic crystals; or a white, fine powder; unctuous to the touch, permanent, soluble in 18 parts of water and 15.3 of alcohol, somewhat volatile with heat; odorless; slightly acid, bitter taste.

Action and Uses.—*External:* Applied in a concentrated form to an abraded surface it produces some irritation and is slightly astringent. Dilute solutions are sedative. It is **antiseptic,** but only feebly disinfectant; used for wounds, burns, surgical operations, conjunctivitis, erysipelas, scaly and parasitic skin diseases, eczema, pruritus, cystitis, vaginitis, leucorrhea, colitis, fetid perspiration, ozena. *Alimentary canal:* Small doses (under 7.5 gr. a day) for a time seem to have no effect upon digestion, but larger ones regularly taken interfere with it. The main objection to it as a food preservative is that it may enable a poor quality of food to pass as a good one. It is used as an antiseptic in fermentative dyspepsia, but is absorbed too quickly to be of service as an intestinal antiseptic. Boric acid is largely eliminated in the urine, making it more acid, used in cystitis due to alkalinity of the urine. Both boric acid and borax are sometimes used in epilepsy, but are not as effective as the bromides; more likely to be successful in cases where the bromides fail. In large doses or taken for some time boric acid or borax causes toxic symptoms, as vomiting, dryness of throat, diarrhea, muscular weakness, eruption, local swellings, emaciation, insomnia.

Borax is not as strongly antiseptic as boric acid, but is more soothing. Used for the same diseases as the acid. It increases the contractile power of the uterus and may produce abortion; used in amenorrhea, dysmenorrhea, puerperal convulsions, borax renders the urine alkaline or less acid.

Preparations and Doses.—Boric acid, 5 to 15 gr. (0.3 to 1 Gm.). Borax, 5 to 30 gr. (0.3 to 2 Gm.). Glycerite of boroglycerin, Ointment of boric acid, Antiseptic solution.

ACIDUM CAMPHORICUM.

Synonym.—Camphoric acid. *Formula:* $H_2C_{10}H_{14}O_4$.

Source.—From camphor by heating with nitric acid.

Description.—Colorless, monoclinic prisms or plates; permanent; soluble in 125 parts of water; readily soluble in alcohol; odorless.

Action and Uses.—External: In ½ to 5 per cent. solution it is used in pharyngitis, acute bronchitis, cystitis. *Internal:* Chiefly used as an **anhydrotic**, particularly in the night-sweats of phthisis, when it should be given in full doses about two hours before the sweating comes on. Also used as an **antiseptic** in pyelitis, cystitis, gonorrhea, and in diarrhea due to intestinal fermentation.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

ACIDUM CITRICUM.

Synonym.—Citric acid. *Formula:* $H_3C_6H_5O_7 . H_2O$.

Source.—Juice of lemons or limes, by boiling, straining, converting into the calcium salt, decomposing and crystallizing.

Description.—Colorless, translucent, rhombic prisms; efflorescent in dry air and deliquescent in moist air; melts and burns on heating; soluble in 0.54 part of water and 1.55 parts of alcohol; odorless; sour taste.

Action and Uses.—External: In solution it is used for pruritus, sunburn, as a gargle in sore throat, to coagulate blood in case of hemorrhage, added to corrosive sublimate tablets to prevent reduction and precipitation. *Internal:* **Refrigerant** in febrile conditions. Given before meals it checks secretion of gastric juice; long-continued use reduces obesity by impairing digestion. One of the best antiscorbutics, both as a prophylactic and as a cure. Has been used in rheumatism, but has been displaced by salicylic acid. Of some service in catarrhal jaundice; antidote to alkalies; the citrates are eliminated as carbonates, rendering the urine alkaline and increasing the amount.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

ACIDUM GALLICUM.

Synonym.—Gallic acid. *Formula:* $HC_7H_5O_5 . H_2O$.

Source.—From tannic acid by the action of a ferment or a dilute acid.

Description.—White or pale-fawn colored; silky, matted needles, or triclinic crystals; permanent; soluble in 83.7 parts of water and 4.14 of alcohol; odorless; astringent, slightly acid taste.

Action and Uses.—Does not coagulate albumin or blood, but is said to act as a mild **astringent** and has been used in some skin diseases. *Internal:* It does not cause constipation; said to contract bloodvessels and may lead to control of capillary hemorrhage. Used as a **hemostatic** and for its supposed astringent effects in epistaxis, hemoptysis, hematuria, albuminuria, pyelitis, diabetes, catarrh of the bladder, bronchitis. Authorities differ as to the value in these diseases, and it is doubtful if much good is derived from it.

Dose.—5 to 20 gr. (0.3 to 1.3 Gm.).

ACIDUM OXALICUM.*

Synonym.—Oxalic acid. *Formula:* $H_2C_2O_4 . 2H_2O$.

Source.—From sugar, cellulose, sawdust, sodium formate, and other substances, by various processes.

Description.—Flat prisms, colorless, slightly efflorescent; soluble in 10 parts of water and 2.5 of alcohol; odorless; strong acid taste. The potassium acid oxalate is known as salt of sorrel and salt of lemon.

Uses.—Rarely used in medicine; has been recommended for asthma, bronchitis, cystitis. Has been taken by mistake for magnesium sulphate; symptoms of poisoning are those of an irritant; lime-water or magnesia are the antidotes.

ACIDUM SALICYLICUM.

Synonyms.—Salicylic acid, Orthoöxybenzoic acid. *Formula:* $HC_7H_5O_3$.

Source.—(1) From oil of wintergreen or oil of birch by treating with an alkali, forming an alkali salicylate and methyl alcohol; the alkali salt is then decomposed by an acid. (2) From phenol by treating with sodium hydroxide and then carbon dioxide.

Description.—Fine, white, prismatic needles, or a bulky, crystalline powder; permanent; soluble in 308 parts of water and 2 of alcohol; odorless, or a slight wintergreen odor; sweetish, then acrid taste. The commercial acid may have a pinkish to brownish color and that made from phenol may have traces of phenol or allied compounds as impurities.

Action and Uses.—*External:* Stronger **antiseptic** than phenol, but not so efficient; the salts are less antiseptic than the acid; used for wounds, ulcers, burns, and gangrene. Germicide for skin diseases, as eczema and scabies. **Anhydrotic,** lessening and disinfecting sweat; mixed with talc, chalk, or starch and applied to feet or axillæ. It **softens epidermis** when applied in strong solution, causing it to peel off; used for warts, corns, thickened epidermis, and freckles. When applied in solution it is an **anodyne** for thrush, pruritus, and urticaria. Sternutatory and irritant to mucous membrane or abraded surface. *Alimentary canal:* Small doses stimulate secretion of gastric juice; large doses cause irritation and impaired digestion; the sodium salts are less harmful; cholagogue. *Circulation:* Small doses stimulate and large doses depress the heart; in some cases the depression may be due to impurities in the acid made from phenol; blood pressure is increased; leucocytes are increased. *Respiration:* Probably quickened and deepened. *Skin:* Vessels are dilated and perspiration is generally increased. *Temperature:* Medicinal doses do not affect normal temperature; febrile temperature is lowered by increased perspiration, dilatation of cutaneous vessels, diminution of heat generated. Chiefly used as a **specific** in rheumatic fever and rheumatic conditions, reducing tempera-

ture, swelling, and pain. Sometimes beneficial in gout, lumbago, sciatica, and migraine. *Elimination:* In urine, feces, sweat, saliva, bronchial mucus. In the urine it occurs as salicylic acid, salicyluric acid, and other compounds; urine is increased and made aseptic and may be green, due to indican and pyrocatechin; it gives a violet color with ferric chloride. *Toxicology:* The symptoms are known as **salicylism**; deafness, fulness of the head, ringing in the ears, dimness of vision, headache, sometimes hemorrhages from the nose, mouth, eyes, or kidneys; delirium. Symptoms can be partly relieved by first giving an alcoholic stimulant.

Dose.—5 to 20 gr. (0.3 to 1.3 Gm.).

ACIDUM STEARICUM.

Synonym.—Stearic acid. *Formula:* $HC_{18}H_{35}O_2$.

Source.—From tallow or suet by superheated steam, as a biproduct in making glycerin.

Description.—White, hard solid; somewhat glossy; permanent; insoluble in water, soluble in 16.6 parts of alcohol; nearly odorless and tasteless.

Action and Uses.—Used in making glycerin suppositories and stearates of some bases.

ACIDUM TANNICUM.

Synonyms.—Tannic acid, Gallotannic acid, Digallic acid, Tannin. *Formula:* $HC_{14}H_9O_9$.

Source.—From nutgalls. (1) By extracting with water, agitating with ether, separating the aqueous solution and concentrating it, then pouring on to plates. (2) By extracting with a mixture of ether and alcohol and shaking this with water, which takes up the acid.

Description.—Light yellowish, amorphous powder; slowly getting darker on exposure to air and light; usually cohering in spongy masses or glistening scales; soluble in 0.34 part of water and 0.23 of alcohol; faint odor; characteristic, astringent taste.

Action and Uses.—External: Applied to an abraded or mucous membrane it coagulates the secretion, forming a protecting layer; entering the tissues it coagulates the liquid in them and further lessens discharge. If the surface is bleeding the clotted blood plugs the vessels and the tissue being contracted tends to check the flow. Used as an **astringent** in a large number of diseases, as ulcers, nasal catarrh, spongy gums, salivation, pharyngitis, laryngitis, leucorrhea, gonorrhea, urethritis, cystitis, hemorrhoids, cutaneous eruptions, eczema, sore nipples. Used as a **styptic** in bleeding from capillaries. *Alimentary canal:* Causes dryness of mouth, puckering, coagulation of saliva, lessened gastric and intestinal secretions, constipation and hardened fecal matter. It undergoes transformation into gallic acid and is absorbed as such; probably has little or no astringent effect after absorption. Used as **astringent** in some diarrheas; as hemostatic in bleeding from stomach or intestines, but probably does not control hemoptysis, metrorrhagia, or hematuria. **Anthelmintic** by enema for thread-worms. **Antidote** for poisoning by alkaloids.

Preparations and Doses.—1 to 15 gr. (0.06 to 1 Gm.). Ointment, Troches, Suppositories, Collodion, Glycerite.

ACIDUM TARTARICUM.

Synonym.—Tartaric acid. *Formula:* $H_2C_4H_4O_6$.

Source.—From crude argols (deposit in wine casks) by converting into the calcium salt and decomposing with sulphuric acid, filtering and crystallizing.

Description.—Colorless, translucent, monoclinic prisms, or crystalline crusts, or white powder; permanent; burns with an odor of burning sugar; soluble in 0.71 part of water and 1.67 of alcohol; odorless; acid taste.

Action and Uses.—Similar to citric acid, but more irritating; chiefly used in making effervescing powders and drinks.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

ACIDUM TRICHLORACETICUM.

Synonym.—Trichloracetic acid. *Formula:* $HC_2Cl_3O_2$.

Source.—By the action of chlorine on acetic acid in the presence of sunlight or by nitric acid on chloral hydrate.

Description.—White or colorless, rhombic crystals; deliquescent; volatilized by heat; very soluble in water and alcohol; slight, characteristic odor.

Action and Uses.—**Escharotic,** penetrates deeply, but little pain; used for warts, lupus, condylomata. **Antiseptic,** in 2 per cent. solution; used for wounds, coryza, ozena, chronic nasal catarrh, tonsillitis, to promote healing of sores. Rarely given internally, but has been used for gastric catarrh and summer diarrhea of infants.

Dose.—1 to 5 gr. (0.06 to 0.3 Gm.).

1. ACIDUM ACETICUM. 2. ACIDUM ACETICUM DILUTUM. 3. ACIDUM ACETICUM GLACIALE.

Synonyms.—(1) Acetic acid. (2) Dilute acetic acid. (3) Glacial acetic acid. *Formula:* $HC_2H_3O_2$.

Source.—From wood by destructive distillation, to a small extent by fermentation.

Description.—(1) Clear, colorless liquid; 36 per cent. by weight of acid; sp. gr. 1.045; miscible in all proportions with water or alcohol; vinegar odor; acid taste. (2) 6 per cent. by weight of acid; sp. gr. 1.009. (3) 99 per cent. by weight of acid; sp. gr. 1.049; solidifies at or below 15° C. A peculiarity of the specific gravity of acetic acid is that it increases with the percentage to about 76 per cent. and remains stationary to 78 per cent., when it begins to decrease, so that 100 per cent. and 40 per cent. have about the same specific gravity.

Action and Uses.—*External:* The glacial acid is used as an **escharotic** when a limited action is wanted, as for warts, condylomata, carcinoma. In dilute solution acetic acid is **irritant** and vesicant, sometimes used for increasing action of other irritants. **Styptic** to check capillary hemorrhage. Inhaled it

may relieve vomiting from ether narcosis. *Internal:* Large doses, or small ones for a long time, cause more or less gastro-intestinal irritation and it has been used to reduce obesity at the expense of digestion. It is refrigerant, somewhat diuretic, and may be used by enema as an anthelmintic.

Dose.—Dilute acid, $\frac{1}{4}$ to 2 ℥ (1 to 8 Cc.).

ACIDUM HYDROCYANICUM DILUTUM.

Synonyms.—Dilute hydrocyanic or prussic acid. *Formula:* HCN.

Source.—From silver cyanide by treating with hydrochloric acid and filtering out the silver cyanide. Or, from potassium ferrocyanide by treating with sulphuric acid and distilling.

Description.—Colorless liquid, volatilized and decomposed on exposure; miscible with water and alcohol in all proportions; 2 per cent. by weight of acid; odor of bitter almonds; very poisonous. Sometimes a brown coating is formed in the bottle, due to the paracyanogen deposited.

Action and Uses.—External: Strong protoplasmic poison; **disinfectant,** but too poisonous to higher forms of life; used in disinfecting trees. Paralyzes the terminations of the sensory nerves; when diluted it is sedative and used for pruritus and skin diseases. *Alimentary canal:* **Sedative,** used for gastralgia, enteralgia, vomiting; effect soon passes off. *Nervous system:* First stimulated, then paralyzed. Used as a sedative for cerebral excitement, giddiness, palpitation, asthma, vertigo, mania, whooping-cough, nervous coughs, coughs that are dry and hacking. It is quickly decomposed in the body and eliminated. *Circulation:* Heart is slowed; blood pressure is raised on account of stimulation of the vasomotor centre; later depression and paralysis. The acid prevents the tissues from taking up the oxygen from the blood, consequently venous blood is bright red. *Respiration:* First stimulated and then paralyzed, death usually resulting from asphyxia.

Toxicology: Dyspnea, slow pulse, giddiness, vomiting, loss of muscular power, dilated pupils, unconsciousness, vol-

untary evacuations of bowels and bladder, asphyxia, collapse, sometimes convulsions. *Treatment:* Generally death comes so quickly that little can be done. Wash out stomach if the case is seen at once; give ammonia by inhalation, brandy or ether hypodermically, cold affusions, intravenous injections of sodium thiosulphate, cobalt chloride, or ferrous sulphate with an alkali by the mouth, artificial respiration. If the patient lives a half-hour after taking the acid, he will probably recover.

Dose.—1 to 5 ♏ (0.06 to 0.3 Cc.).

ACIDUM LACTICUM.

Synonym.—Lactic acid. *Formula:* $HC_3H_5O_3$.

Source.—From sugar by lactic fermentation.

Description.—Colorless, syrupy liquid; hygroscopic; miscible with water or alcohol; 75 per cent. by weight of acid, sp. gr. 1.206; odorless; acid taste.

Action and Uses.—Locally it is used as an **escharotic** to dissolve false membrane in diphtheria and croup; also applied to laryngeal growths, tuberculous ulcerations, caries, lupus, venereal warts. It was supposed to be a normal acid of the gastric juice and is given in **tonic** preparations for indigestion.

Dose.—15 to 45 ♏ (1 to 3 Cc.).

ACIDUM OLEICUM.

Synonym.—Oleic acid. *Formula:* $HC_{18}H_{33}O_2$.

Source.—Obtained as a biproduct in the manufacture of stearic acid and glycerin.

Description.—Yellowish or brownish yellow, oily liquid; turns darker and absorbs oxygen on exposure; sp. gr. 0.895; lard-like odor and taste.

Action and Use.—Used only in the making of oleates, which are readily absorbed.

LIQUID MINERAL ACIDS.

General Action.—They are more or less caustic, generally acting by withdrawing water from the tissues; weak solutions coagulate albumin and check capillary hemorrhage by plugging the vessels and contracting the tissue surrounding the vessels and so contracting the vessels; still weaker solutions applied to the skin have a cooling effect. *Alimentary canal:* They attack the enamel of the teeth, consequently should be taken through a tube only after high dilution, and the mouth should be rinsed at once. As acids increase alkaline secretions, the saliva is increased. Taken before or with meals they check secretion of gastric juice, but taken after a meal they may aid digestion by supplying the necessary acid. Converted into salts they are quickly absorbed and eliminated and may irritate the bladder and make the urine more acid.

Toxicology.—The symptoms are those of an irritant; burning pain in mouth, throat, and stomach; thirst, vomiting; the vomit may contain blood or shreds of mucous membrane; sometimes diarrhea, respiration slow and labored, pulse feeble and rapid, skin cold and clammy, subnormal temperature, collapse. The acid or vapor may get into the larynx and quickly cause death. *Treatment:* Use stomach tube if the walls of the esophagus or stomach are probably not much weakened; do not give an emetic; give large draughts of water, or milk with magnesium oxide, chalk, whiting, soapsuds, olive oil, white of egg, mucilaginous drinks, morphine for pain; strychnine, ether, and stimulants for collapse.

ACIDUM HYDRIODICUM DILUTUM.

Synonym.—Dilute hydriodic acid. *Formula:* HI.

Source.—From potassium iodide by the addition of a solution of tartaric acid, filtering out the potassium bitartrate formed.

Description.—Clear, colorless liquid; turning red or brown on exposure, unless protected by some reducing agent; mis-

cible with water and alcohol in all proportions; 10 per cent. by weight of acid; sp. gr. 1.106; odorless; acid taste. The official acid contains a little hypophosphorous acid to prevent liberation of iodine; should not be used if it is colored.

Action and Uses.—Similar to potassium iodide.

Doses.—5 to 15 ♏ (0.3 to 1 Cc.). Syrup, ½ to 2 ʒ (2 to 8 Cc.).

ACIDUM HYDROBROMICUM DILUTUM.

Synonym.—Dilute hydrobromic acid. *Formula:* HBr.

Source.—From potassium bromide by adding a solution of tartaric acid, and filtering out the potassium bitartrate formed. Or by mixing a strong solution of potassium bromide with sulphuric acid and distilling the liquid.

Description.—Clear, colorless liquid; permanent; miscible with water and alcohol in all proportions; 10 per cent. by weight of acid; sp. gr. 1.076; odorless; acid taste.

Action and Uses.—Similar to potassium bromide but mostly used to prevent the ringing in the ears produced by quinine.

Dose.—¼ to 2 ʒ (1 to 8 Cc.).

1. ACIDUM HYDROCHLORICUM. 2. ACIDUM HYDROCHLORICUM DILUTUM.

Synonyms.—(1) Hydrochloric or Muriatic acid. (2) Dilute hydrochloric or Dilute muriatic acid. *Formula:* HCl.

Source.—From sodium chloride by treating with sulphuric acid and distilling.

Description.—(1) Colorless, fuming liquid; volatilizing on exposure; miscible with water and alcohol in all proportions; 31.9 per cent. by weight of acid; sp. gr. 1.158; pungent, suffocating odor; strongly acid taste. (2) Dilute acid does not fume; 10 per cent. by weight of acid; sp. gr. 1.049; odorless.

Action and Uses.—External: Strong acid penetrates the skin, producing vesication, and may destroy the tissue; used on warts, epithelial growths, septic wounds and bites. Highly

diluted it is used in baths for some skin diseases. *Internal:* Given highly diluted after meals it is a **tonic** when there is a deficient amount of hydrochloric acid normally in the juice; in phthisis, gastric catarrh, atonic dyspepsia. Given before meals to check gastric secretion in cases of acid eructations and heartburn. Sometimes given in typhoid and other enteric fevers.

Dose.—Dilute acid, 5 to 30 ♏ (0.3 to 2 Cc.).

1. ACIDUM HYPOPHOSPHOROSUM. 2. ACIDUM HYPOPHOSPHOROSUM DILUTUM.

Synonyms.—Hypophosphorous and Dilute hypophosphorous acid. *Formula:* HPH_2O_2.

Source.—From potassium hypophosphite by treating with a solution of tartaric acid and filtering out the potassium bitartrate formed.

Description.—(1) Colorless liquid, nearly permanent; miscible with water and alcohol in all proportions; 30 per cent. by weight of acid; sp. gr. 1.13; odorless; strong acid taste. (2) Contains 10 per cent. by weight of acid; sp. gr. 1.042.

Action and Uses.—Similar to calcium hypophosphite, but chiefly used in the syrups of hypophosphites and in preparations where a reducing agent is desirable for preservation.

Dose.—Dilute acid, 5 to 30 ♏ (0.3 to 2 Cc.).

1. ACIDUM NITRICUM. 2. ACIDUM NITRICUM DILUTUM.

Synonyms.—Nitric and Dilute nitric acid. *Formula:* HNO_3.

Source.—From sodium nitrate by treating with sulphuric acid and distilling.

Description.—(1) Colorless, fuming liquid; losing strength on exposure and becoming red; miscible with water in all proportions; decomposes alcohol; 68 per cent. by weight of acid; sp. gr. 1.403; colors organic matter yellow; irritating,

suffocating odor; extremely acid taste. (2) Dilute acid contains 10 per cent. by weight of acid; sp. gr. 1.054; not fuming.

Action and Uses.—External: Strong **escharotic,** not redissolving albumin; it is self-limited and consequently frequently used for warts, venereal ulcers, hemorrhoids, poisoned wounds, as bites of snakes or dogs, but not so good in these as potassium hydroxide; stains the tissue yellow. Diluted acid is an irritant and **astringent**; used for skin diseases, as lepra or acne. *Internal:* Increases secretion of saliva, gastric and intestinal juices and bile more than other acids; **tonic** in gastric and intestinal indigestion; **astringent** in enteric diarrhea; **cholagogue** in jaundice; of benefit in oxaluria, phosphaturia, skin diseases; recommended in diabetes and syphilis, aphonia of speakers.

Dose.—Dilute acid, 5 to 30 ♏ (0.3 to 2 Cc.).

1. ACIDUM NITROHYDROCHLORICUM. 2. ACIDUM NITROHYDROCHLORICUM DILUTUM.

Synonyms.—(1) Nitrohydrochloric or nitromuriatic acid, Aqua regia. (2) Dilute nitrohydrochloric or Dilute nitromuriatic acid. *Formula:* It is a mixture of chlorine, oxides of nitrogen and other compounds, so no formula can be given.

Source.—Mixing nitric and hydrochloric acids.

Description.—(1) Golden-yellow, fuming liquid; losing strength on exposure; very corrosive; odor of chlorine and oxides of nitrogen. (2) Dilute acid is colorless or has a faint yellow color, does not fume; slight odor of chlorine; soon loses its properties.

Action and Uses.—Similar to nitric and hydrochloric acids. Escharotic, irritant, astringent, tonic, cholagogue.

Doses.—Dilute, 5 to 30 ♏ (0.3 to 2 Cc.). Strong, 3 to 6 ♏ (0.18 to 0.36 Cc.); both highly diluted.

1. ACIDUM PHOSPHORICUM. 2. ACIDUM PHOSPHORICUM DILUTUM.

Synonyms.—(1) Phosphoric, Orthophosphoric. (2) Dilute phosphoric acid. *Formula:* H_3PO_4.

Source.—From phosphorus by oxidizing with nitric acid or with iodine and bromine.

Description.—(1) Colorless liquid, syrupy; miscible with water or alcohol in all proportions; hygroscopic; 85 per cent. by weight of acid; sp. gr. 1.707; odorless; strong acid taste. (2) Dilute acid contains 10 per cent. by weight of acid; sp. gr. 1.057.

Action and Uses.—External: **Escharotic** by abstracting moisture, difficult to limit; not so irritating as hydrochloric, nitric, or sulphuric acid. *Internal:* **Tonic** in some forms of dyspepsia; checks acidity in heartburn; used in hysteria, nervous exhaustion, melancholia, low fevers, diabetes, night-sweats of phthisis.

Dose.—Dilute acid, 5 to 30 ♏ (3 to 2 Cc.).

ACIDUM METAPHOSPHORICUM.*

Synonyms.—Glacial phosphoric acid, Metaphosphoric acid. *Formula:* HPO_3.

Source.—From phosphorus pentoxide by dissolving in water or by heating orthophosphoric acid.

Description.—Usually occurs in hard, transparent masses or sticks, which change to the pyro- and ortho-variety on exposure; hygroscopic; soluble in water; odorless; acid taste.

Action and Uses.—Chiefly used as a substitute for the orthophosphoric acid, when it is prescribed with the soluble phosphate or pyrophosphate of iron.

1. ACIDUM SULPHURICUM. 2. ACIDUM SULPHURICUM AROMATICUM. 3. ACIDUM SULPHURICUM DILUTUM.

Synonyms.—(1) Sulphuric acid, Oil of vitriol. (2) Aromatic sulphuric acid, Elixir of vitriol. (3) Dilute sulphuric acid. *Formula:* H_2SO_4.

Source.—From sulphur by burning and then oxidizing with nitric acid.

Description.—(1) Colorless, oily liquid; hygroscopic; miscible in all proportions with water and alcohol; 92.5 per cent. by weight of acid; sp. gr. 1.826; odorless; very acid, corrosive taste. (2) Aromatic acid is almost colorless at first, becoming dark red in time; not less than 20 per cent. by weight of acid; sp. gr. about 0.933; aromatic, ethereal odor; aromatic, acid taste. (3) Dilute acid contains 10 per cent. by weight of acid; sp. gr. 1.067.

Action and Uses.—External: Extracts hydrogen and oxygen from tissues, leaving carbon. **Escharotic,** difficult to limit; used for warts, indolent ulcers, gangrene. *Internal:* Increases appetite, **tonic** in convalescence from fevers. Preserves its astringency in the intestines more than other acids; used in mucous diarrhea, dysentery, prophylactic and cure for epidemic cholera; remote **astringent** and **hemostatic** in hemoptysis and hemorrhage from mucous membranes; **anhydrotic** for night-sweats of phthisis; prophylactic and **antidote** for lead poisoning; used also for phosphaturia and skin diseases. The aromatic acid is best for internal administration.

Doses.—Dilute acid, 5 to 30 ♏ (0.3 to 2 Cc.). Aromatic acid, 5 to 20 ♏ (0.3 to 1.3 Cc.).

ACIDUM SULPHUROSUM.

Synonym.—Sulphurous acid. *Formula:* H_2SO_3.

Source.—From sulphuric acid by heating with charcoal and passing the gas into water.

Description.—Colorless liquid, losing sulphur dioxide and changing to sulphuric acid on exposure; miscible with water

and alcohol in all proportions; not less than 6 per cent. by weight of acid; sp. gr. 1.028; odor of burning sulphur; sulphurous taste.

Action and Uses.—External: **Disinfectant,** strong reducing agent, taking away oxygen; bleaches organic colors; destroys plants, animals, unformed ferments. Has been much used to disinfect rooms after contagious diseases; generated by burning sulphur; best to have steam or moisture present, as the gas is more penetrating. **Antiseptic** and deodorant; used as a spray or mop for diphtheria, stomatitis, ulcers on the tonsils, parasitic skin diseases, septic sore throat, thrush, scabies, pruritus. *Internal:* Not used much, sometimes for fermentation in stomach, for skin diseases, as urticaria and purpura.

Dose.—5 to 60 ♏ (0.3 to 4 Cc.).

SALTS.

POTASSII ACETAS.

Synonyms.—Potassium acetate, Sal diureticus. *Formula:* $KC_2H_3O_2$.

Source.—Nearly neutralizing acetic acid with potassium bicarbonate and evaporating.

Description.—A white, granular powder, or soft, crystalline masses of a satin-like lustre; very deliquescent on exposure to air; soluble in 0.4 part water and 2 parts alcohol; nearly odorless; warm, saline taste.

Action and Uses.—*Alimentary canal:* Large doses act as a **purgative,** used in catarrhal jaundice and hepatic torpor. *Blood:* The salt is changed to a carbonate and makes the blood more alkaline; on account of this it is used in gout and rheumatism. *Kidneys:* Decreases the normal acidity of the urine and may make it alkaline, and also increases the amount of urine. **Diuretic,** used to relieve irritation of the urinary organs when due to excessive acidity; used in dropsy and to prevent the deposit of uric acid calculi; has been used to dissolve calculi in the bladder, but probably is of no service. **Diaphoretic** in feverish conditions of children. **Expectorant,** increasing the secretion and making it thinner. Antiscorbutic, used in some skin diseases.

Dose.—5 to 30 gr. (0.3 to 2 Gm.) as diuretic; 2 to 8 ʒ (8 to 30 Gm.) as purgative.

POTASSII BICARBONAS.

Synonyms.—Potassium bicarbonate or acid carbonate. *Formula:* $KHCO_3$.

Source.—Passing carbon dioxide through a solution of potassium carbonate and crystallizing.

Description.—Transparent, colorless, monoclinic prisms, or granular powder; permanent in air; soluble in about 3 parts of water and nearly insoluble in alcohol; saline, slightly alkaline taste.

Action and Uses.—Similar to potassium hydroxide, but much weaker. Chiefly used internally. **Antacid,** used in excessive acidity of the stomach, but not so good as sodium bicarbonate. Diuretic, used in rheumatism and gout. Expectorant, increases secretion and renders it thinner.

Dose.—5 to 45 gr. (0.3 to 3 Gm.).

POTASSII BITARTRAS.

Synonyms.—Potassium bitartrate or acid tartrate, Cream of tartar. *Formula:* $KHC_4H_4O_6$.

Source.—By purifying crude argol, which is a deposit in wine casks.

Description.—Rhombic prisms, colorless or somewhat opaque from calcium tartrate as an impurity; more commonly occurring as a white, somewhat gritty powder; permanent soluble in about 200 parts of water, nearly insoluble in alcohol odorless; acidulous taste.

Action and Uses.—Alimentary canal: Large doses cause profuse, watery stools, without irritation or griping, concentrating the blood. Taken slowly in hot solution before breakfast it is a **laxative,** used for hemorrhoids; it is a hydragogue **cathartic** and used in dropsy due to nephritis or uremia; often combined with jalap, senna or magnesia; **refrigerant** in mild febrile conditions; cholagogue in hepatic cirrhosis and gall stones; anti-emetic in vomiting of pregnancy. **Diuretic,** used in dropsy.

Doses.—½ to 2 ʒ (2 to 8 Gm.) largely diluted with water, as a diuretic; 4 to 8 ʒ (15 to 30 Gm.), as a purgative.

POTASSII BROMIDUM.

Synonym.—Potassium bromide. *Formula:* KBr.

Source.—Adding bromine to a solution of potassium hydroxide, evaporating, heating with charcoal, crystallizing from water.

Description.—Colorless or white, cubical crystals, or a granular powder; permanent; soluble in 1.5 parts of water and 180 of alcohol; odorless; saline, pungent taste. Commercial salt is liable to contain a carbonate.

Action and Uses.—*External:* Diminishes reflex excitability; formerly used as local **sedative** for laryngeal examinations, for hemorrhoids and fissures. *Alimentary canal:* Probably converted into sodium bromide in stomach and absorbed as such. May interfere with digestion if long continued, by diminishing secretions. Gastro-intestinal irritant in concentrated solution. *Nervous system:* Chief action is here. Depresses the functions of the central nervous system, commencing with the higher centres, then the lower ones, following the law of dissolution; diminishes reflex excitability, as shown in touching the fauces, conjunctiva, or skin; lowers mental activity, causing drowsiness and sleep; sleep is not very refreshing; more or less mental confusion on waking. **Antispasmodic,** relieves and sometimes cures epilepsy, but must be given over a long period of time and best given with a stimulant or tonic; used in chorea, hysteria, convulsions, tetanus, spasmodic asthma, whooping-cough, night screaming of children, migraine, spasmodic dysmenorrhea; **hypnotic** in insomnia from overwork or worry, delirium tremens, nervousness; of but little use where pain is present. **Anti-emetic** in vomiting of pregnancy, from etherization, or from opium. **Prophylactic** for seasickness. *Circulation:* Depressed by large doses, due to the potassium rather than bromine; some anemia of the brain. *Respiration:* Depressed by large doses. *Sexual Organs:*

Depressed, **anaphrodisiac** in nymphomania, priapism, seminal emissions. *Metabolism:* Generally lessened. *Elimination:* Mainly in the urine, some in the sweat, milk, and secretions of mucous membranes; commences in a short time, but goes on slowly. **Antidote** to strychnine poisoning; relieves cinchonism and salicylism; aids the elimination of lead, mercury, and copper in chronic poisoning by these.

Toxicology.—When taken for some time potassium bromide causes symptoms known as bromism; eruption on face and back or small pustules or brown coloration of the skin; coated tongue, foul breath, disordered digestion, emaciation, muscular weakness, apathy, coryza, conjunctivitis, lowered sensibility of the skin, stupidity, slowness of speech, inability to sleep, impairment of mental faculties, melancholia. Dose has to be gradually increased. The eruption may be relieved by the giving of Fowler's solution. Habit is quite easily formed, but more easily broken than in case of morphine. Treatment: Give diuretics, tonics, stimulants, strychnine, caffeine, digitalis, belladonna, ergot, morphine.

Doses.—5 to 60 gr. (0.3 to 4 Gm.) in solution; 2 to 4 ʒ (8 to 15 Gm.) in strychnine poisoning.

POTASSII CARBONAS.

Synonyms.—Potassium carbonate, Sal tartar, Salt of tartar, Pearl ash (applied to the impure). *Formula:* K_2CO_3.

Source.—(1) By percolating wood ashes, evaporating the solution, calcining and purifying. (2) By Leblanc's process for sodium carbonate. (3) From washings of wool or sugar-beet ash.

Description.—A white, granular powder; very deliquescent; soluble in 0.9 part of water, insoluble in alcohol; nearly odorless; strongly alkaline taste.

Action and Uses.—Similar to potassium hydroxide, but less active and caustic. Not often used in medicine.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

POTASSII CHLORAS.

Synonym.—Potassium chlorate. *Formula:* $KClO_3$.

Sources.—Passing chlorine into calcium or magnesium hydroxide suspended in water, forming calcium or magnesium hypochlorite and chloride, then heating and treating the solution with potassium chloride, the potassium chlorate crystallizing out.

Description.—Shining plates or monoclinic prisms, or white, granular powder; permanent; soluble in 16 parts of water, insoluble in alcohol; odorless; cooling, characteristic taste. It should not be heated or rubbed with organic or easily oxidized matter, as explosion may result.

Action and Uses.—Formerly it was thought that it gave up its oxygen, acting as an antiseptic and an oxidizer, but this is now known to be untrue; practically all that is taken internally is eliminated unchanged. *External:* Deodorant, detergent, **alterative**; in the form of a gargle or wash a saturated solution is of benefit in ulcerated, aphthous, or catarrhal conditions of the mouth and fauces, in thrush, nursing sore mouth, tonsillitis; its action is not understood. *Internal:* It has been used in a large number of diseases where free oxygen might be of benefit. It is still advocated for diphtheria, scarlatina, hematuria, ovarian tumor, cystitis, and in treatment of habitual miscarriage. Large doses, or small ones continued for some time, cause the formation of methemoglobin and the destruction of the red blood corpuscles, depression of the heart, cyanosis, dyspnea, headache, acute nephritis, jaundice, suppression of urine, uremia, delirium, coma, convulsions. It is eliminated chiefly through the kidneys, but to a small extent through sweat, saliva, tears. Many physicians now look upon potassium chlorate as one of the more poisonous of the potassium salts; it has undoubtedly caused several deaths. In treating a case of poisoning, if any chlorate remains in the stomach, wash it out; give demulcent drinks, as mucilages, white of egg; cardiac stimulants, as alcohol, strychnine; diuretics and a large amount of water to flush the kidneys; keep loins warm.

Dose.—1 to 15 gr. (0.06 to 1 Gm.).

POTASSII CITRAS.

Synonym.—Potassium citrate. *Formula:* $K_3C_6H_5O_7 . H_2O$.

Source.—Neutralizing a solution of citric acid with potassium bicarbonate, evaporating, and granulating.

Description.—A white, granular powder or transparent, crystalline scales; deliquescent; soluble in 0.5 part of water, nearly insoluble in alcohol; odorless; cooling, saline taste.

Action and Uses.—Similar to potassium acetate, but not absorbed as readily; more antiscorbutic; more diaphoretic, particularly when given with spirit of nitrous ether; better antirheumatic.

Preparation and Doses.—5 to 30 gr. (0.3 to 2 Gm.). Solution, 2 to 8 ʒ (8 to 30 Cc.) or more. Effervescing citrate, ½ to 2 ʒ (2 to 8 Gm.).

POTASSII CYANIDUM.

Synonym.—Potassium cyanide. *Formula:* KCN.

Source.—(1) Passing hydrocyanic acid gas, generated by the action of sulphuric acid on potassium ferrocyanide, into a solution of potassium hydroxide. (2) Heating desiccated potassium ferrocyanide with potassium carbonate until mass stops effervescing and decanting the upper, white layer.

Description.—White, amorphous masses or white, granular powder; deliquescent; soluble in 2 parts of water, nearly insoluble in alcohol; odorless when dry, but has the odor of hydrocyanic acid when moist; bitter, alkaline taste, but should not be tasted.

Action and Uses.—Similar to hydrocyanic acid. Applied locally it may produce dermatitis. In the stomach hydrocyanic acid is slowly liberated.

Dose.—$\frac{1}{20}$ to ¼ gr. (0.003 to 0.015 Gm.).

POTASSII DICHROMAS.

Synonyms.—Potassium dichromate or bichromate, Red chromate of potassium. *Formula:* $K_2Cr_2O_7$.

Source.—Heating chrome iron with potassium carbonate and calcium hydroxide, dissolving out the potassium chromate, treating with sulphuric acid and crystallizing.

Description.—Large, orange-red, transparent, triclinic prisms, or four-sided plates; permanent; soluble in 9 parts of water, insoluble in alcohol; odorless; acid, metallic taste.

Action and Uses.—Chiefly as an **escharotic** similar to chromium trioxide, but milder. Formerly used internally for secondary syphilis and some other diseases.

Dose.—$\frac{1}{10}$ to $\frac{1}{2}$ gr. (0.006 to 0.03 Gm.).

POTASSII ET SODII TARTRAS.

Synonyms.—Potassium and sodium tartrate, Rochelle salt, Sal Rochelle, Signette's salt, Tartrated soda. *Formula:* $KNaC_4H_4O_6 . 4H_2O$.

Source.—From cream of tartar by neutralizing a hot solution of sodium carbonate, then crystallizing.

Description.—Large, transparent, rhombic prisms, or white powder; slightly efflorescent; soluble in 1.2 parts of water, nearly insoluble in alcohol; odorless; cooling, saline taste.

Action and Uses.—Typical **saline purgative.** Does not cause irritation, but absorbs water from blood and tissues until about 5 or 6 per cent. solution of the salt is formed, when a painless, soft stool is passed; acts usually in two or three hours; more readily borne by the stomach than most saline cathartics. Used in constipation, in dropsy, hemorrhoids, to remove objectionable matter from the bowel. **Diuretic** and in small doses it renders the urine alkaline.

Preparations and Doses.—1 to 4 ℥ (4 to 15 Gm.). Compound effervescing powder.

POTASSII FERRICYANIDUM.*

Synonyms.—Potassium ferricyanide, Red prussiate of potash. *Formula:* $K_3Fe(CN)_6$.

Source.—Passing chlorine into a solution of potassium ferrocyanide.

Description.—Dark red, transparent prisms; permanent in dry air; soluble in 4 parts of water; saline taste.

Use.—Only as a test reagent.

POTASSII FERROCYANIDUM.

Synonyms.—Potassium ferrocyanide, Yellow prussiate of potash. *Formula:* $K_4Fe(CN)_6 . 3H_2O$.

Source.—From iron by heating with horn, leather, or other nitrogenous substance and potassium carbonate, treating with water and crystallizing.

Description.—Large, soft, lemon-yellow, four-sided, tabular crystals or prisms; friable, slightly efflorescent; soluble in 4 parts of water, insoluble in alcohol; odorless; somewhat saline taste.

Action and Uses.—Seldom used in medicine except as an antidote for copper poisoning or for the production of hydrocyanic acid. When pure it has but little effect even in large amounts.

Dose.—5 to 15 gr. (0.3 to 1 Gm.).

POTASSII HYDROXIDUM.

Synonyms.—Potassium hydroxide or hydrate, Potassa, Caustic potash. *Formula:* KOH.

Source.—From a solution of the hydroxide which is obtained by boiling a solution of potassium carbonate with milk of lime. The mixture is filtered and evaporated in a silver or iron dish and then poured into molds. Sometimes purified by the use of alcohol or barium hydroxide.

Description.—Generally in white pencils or masses, sometimes in flakes; hard, brittle, somewhat crystalline fracture; very deliquescent; absorbs carbon dioxide from air; soluble in 0.4 part of water and 2 parts of alcohol; slight odor of lye; strongly alkaline and caustic taste.

Action and Uses.—External: Absorbs water from tissues, forms compounds with albuminous matter, saponifies fatty matter, destroys living tissue; action is difficult to limit, burning deep and wide, causing much pain; penetrates more deeply than most caustics. **Escharotic,** used for lupus, cancer, snake or dog bite, abscesses, corns, bunions, warts, and ingrowing toe-nails; the surrounding tissue should be protected by petrolatum, wax, or adhesive plaster in which a hole the correct size is cut. To remove the caustic, wash with a dilute acid. In dilute solution it is used to wash off the skin, dissolving the oily exudation, before an operation. Very dilute solutions have a **sedative** effect and are used to relieve itching in pruritus, urticara, etc. *Alimentary canal:* Very dilute solutions may increase saliva by reflex action, but usually alkalies decrease alkaline secretions. Increases gastric juice if given before a meal or neutralizes it when given after a meal; used as an **antacid** in excessive acidity; reduces obesity by producing a mild form of poisoning. *Kidneys:* Urine is increased and rendered less acid; not so good as the bicarbonate or organic salts of potassium.

Toxicology.—Burning sensation in throat and stomach, thirst, vomiting, diarrhea, intense abdominal pain; cold, clammy skin; red and swollen lips and tongue, feeble pulse, labored breathing, collapse. Patient may recover from immediate effects and die later on account of extensive ulceration or cicatrization of the esophagus or stomach. *Treatment:* Give emetics, as apomorphine, luke-warm water, tickling the fauces; best not to use the stomach pump or tube for fear of puncturing the weakened wall. Give dilute acids, as vinegar or lemon-juice; demulcents, as fixed oils, white of egg; or mucilaginous drinks, as linseed tea; stimulants to prevent collapse; warmth.

Preparation and Dose.—Solution, 5 to 30 ♏ (0.3 to 2 Cc.).

POTASSII HYPOPHOSPHIS.

Synonym.—Potassium hypophosphite. *Formula:* KH_2PO_2.

Source.—From a solution of calcium hypophosphite by the addition of potassium carbonate.

Description.—Usually in white, opaque, crystalline masses, or granular powder, or hexagonal plates; very deliquescent; soluble in 0.5 part of water, in 7 parts of alcohol; odorless; warm, saline taste.

Action and Uses.—Similar to calcium hypophosphite.

Preparations and Doses.—5 to 15 gr. (0.3 to 1 Gm.). Syrup and Compound syrup of hypophosphites, Emulsion of cod-liver oil and hypophosphites.

POTASSII IODIDUM.

Synonym.—Potassium iodide. *Formula:* KI.

Source.—Iodine is added to a solution of potassium hydroxide, forming the iodide and iodate and the iodate is reduced to iodide by heating with charcoal.

Description.—Colorless, translucent, or white, opaque, cubical crystals, or a white, granular powder; slightly deliquescent in damp air, permanent in dry air; soluble in 0.7 part of water, in 12 of alcohol; faint iodine odor; pungent, bitter taste. Commercial salt is very liable to contain a carbonate to prevent liberation of iodine and prevent discoloration.

Action and Uses.—External: No effect applied to skin, but may be an irritant and be absorbed when applied to mucous membrane. *Internal:* It is not known how it acts, but it has a strong effect on nutrition and metabolism. Rapidly absorbed, unchanged, and may be found in the urine in a few minutes, but is less rapidly eliminated. It is perhaps partly decomposed, liberating a little iodine. Its chief use is as an **alterative** and **specific** in tertiary syphilis; better than any other agent; causes absorption of deposits; often combined with mercuric chloride in secondary syphilis and of but little bene-

fit in the primary stage; given in large doses and continued over a long period—one to three years sometimes. It is also used in gout, chronic or gonorrheal rheumatism, cirrhosis of liver, aneurysms, symptomatic and hay asthma, some skin diseases, goitre, pleurisy to promote the absorption of inflammatory products, to aid the elimination of lead and mercury in chronic poisoning by these. It is an **expectorant** in bronchitis, used as a gargle for sore throat, diuretic in heart diseases, anaphrodisiac, antigalactagogue. Taken for some time potassium iodide may produce symptoms known as **iodism**: coryza with profuse watery discharge, conjunctivitis, sore throat, swelling about the fauces, ptyalism, frontal headache, skin eruption, temporary impotence, sometimes ringing in the ears, rarely atrophy of mammæ or testes. Sometimes another train of symptoms ensue: rapid emaciation, ravenous appetite, cardiac palpitation, cerebral excitement. The giving of alkalies sometimes prevents iodism. Children bear the drug better than adults. A tolerance is often established. It may be given in syrup sarsaparilla, fluidextract of licorice, milk; best given about an hour after meals.

Preparation and Dose.—5 to 20 gr. (0.3 to 1.3 Gm.), as high as 1 ℥ (4 Gm.) in syphilis. Ointment.

POTASSII NITRAS.

Synonyms.—Potassium nitrate, Nitre, Saltpetre, India saltpetre, Sal prunella (when fused). *Formula:* KNO_3.

Source.—Found in the earth, but largely made from potassium chloride by decomposition with sodium nitrate.

Description.—Colorless, transparent, six-sided prisms, or a white, crystalline powder; slightly hygroscopic in moist air; soluble in 3.6 parts of water, nearly insoluble in alcohol: odorless; saline, cooling taste.

Action and Uses.—External: **Irritant** to mucous membrane. Applied to the face and dampened with water it aids in the removal of freckles. **Antiseptic**, used in curing meat. *Internal:* It is a diaphoretic, refrigerant, and **expectorant**, used in inflammation of trachea, bronchitis, pneumonia,

febrile conditions, hoarseness of speakers. Formerly much used as a **diuretic**, but has been displaced by acetates and citrates. **Antispasmodic**, acting on respiration and unstriped muscular tissue; used for asthma by inhaling fumes of burning paper impregnated with it; it is often an ingredient in asthma cigarettes. In large doses it is a severe gastro-intestinal irritant, cardiac, and respiratory depressant.

Dose.—5 to 15 gr. (0.3 to 1 Gm.).

POTASSII PERMANGANAS.

Synonym.—Potassium permanganate. *Formula:* $KMnO_4$.

Source.—Heating manganese dioxide, potassium hydroxide, and potassium chlorate to fusion and then treating with boiling water and crystallizing.

Description.—Dark-purple, slender, monoclinic prisms; almost opaque by transmitted light; blue metallic lustre by reflected light; permanent; soluble in 15 parts of water; decomposed by alcohol; odorless; sweet, then disagreeable, metallic, astringent taste; rubbed dry with organic or reducing matter it is liable to cause explosion.

Action and Uses.—External: Strong oxidizer, easily liberating its oxygen; stains clothing or animal tissue by the deposition of manganese dioxide, the stain being removed by a solution of oxalic acid. In strong solution it is an irritant and mild escharotic. Strong **antiseptic** and **deodorant**, but does not penetrate, soon becomes inert, which is shown by the disappearance of the blue or pink color. In solution (20 to 60 gr. in a pint of water) it is used as a lotion for ulcers, wounds, abscesses, gangrene, cancer, eczema, carbuncles, diphtheria, scarlet fever. In dilute solution (1 to 4 gr. in a pint of water) it is injected for gonorrhea and leucorrhea. **Disinfectant** for sputa, stools, and hands. Injected into a snake bite and into the surrounding tissue it may destroy the venom. *Internal:* Quickly decomposed in the alimentary canal by the albuminous matter and very little is absorbed, none in the form of permanganate; best given in pills. It is used as an **antiseptic** in certain forms of dyspepsia; **tonic** in anemia, the manganese

acting much like iron; **antirheumatic** in acute rheumatism, aiding the oxidation of uric acid; ecbolic, **emmenagogue** in amenorrhea caused by exposure to cold, but manganese dioxide is better. **Antidote** for morphine poisoning, should be given frequently to destroy the morphine that is excreted into the stomach; hypodermic injection is undoubtedly useless.

Dose.—½ to 3 gr. (0.03 to 0.18 Gm.).

POTASSII SULPHAS.

Synonym.—Potassium sulphate. *Formula:* K_2SO_4.

Source.—Exists in nature; largely obtained as a biproduct in the manufacture of chemicals.

Description.—Transparent, colorless, six-sided, rhombic prisms terminated by pyramids, or powder; permanent; soluble in 9 parts of water, insoluble in alcohol; odorless; sharp, somewhat bitter, saline taste.

Action and Uses.—In small doses it is a gentle laxative and in large ones a **purgative**, causing considerable griping and irritation, and may produce abortion; formerly supposed to be cholagogue; rarely used now.

Dose.—½ to 2 ʒ (2 to 8 Gm.).

SODII ACETAS.

Synonym.—Sodium acetate. *Formula:* $NaC_2H_3O_2 . 3H_2O$.

Source.—From acetic acid by neutralizing with sodium carbonate.

Description.—Transparent, colorless, monoclinic prisms, or a granular, crystalline powder; somewhat efflorescent; soluble in 1 part of water and 23 of alcohol, liquefies at 60° C.; odorless; cooling, saline taste.

Action and Uses.—Similar to potassium acetate, but rarely used.

Dose.—10 to 60 gr. (0.6 to 4 Gm.).

SODII ARSENAS.

Synonym.—Sodium arsenate. *Formula:* $Na_2HAsO_4.7H_2O$.

Source.—Fusing arsenic trioxide, sodium nitrate, and sodium carbonate and then treating with hot water, and crystallizing.

Description.—Transparent, colorless, monoclinic prisms; slightly efflorescent in dry air and deliquescent in moist air; soluble in 1.2 parts of water, nearly insoluble in alcohol; odorless; alkaline taste, but should be tasted with great caution. Exsiccated Sodium arsenate (U. S. P.) is a white, amorphous powder, soluble in 3 parts of water.

Action and Uses.—Similar to arsenic trioxide.

Preparations and Doses.—$\frac{1}{20}$ to $\frac{1}{8}$ gr. (0.003 to 0.008 Gm.). Dried sodium arsenate, $\frac{1}{30}$ to $\frac{1}{10}$ gr. (0.002 to 0.006 Gm.). Solution, 1 to 10 ♏ (0.06 to 0.6 Cc.).

SODII BENZOAS.

Synonym.—Sodium benzoate. *Formula:* $NaC_7H_5O_2$.

Source.—From benzoic acid by neutralizing with sodium bicarbonate.

Description.—White, amorphous, granular or crystalline powder; soluble in 1.6 parts of water and 43 parts of alcohol; odorless; sweet, astringent taste.

Action and Uses.—Similar to benzoic acid. Largely used to render alkaline urine acid and as a substitute for the salicylate in septic diseases, gout, and rheumatism.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

SODII BICARBONAS.

Synonyms.—Sodium bicarbonate, Baking or Cooking soda. *Formula:* $NaHCO_3$.

Source.—From sodium carbonate by passing carbon dioxide through a solution.

Description.—White powder, permanent in dry air, slowly changed to the carbonate in moist air, becoming alkaline; soluble in 12 parts of water, insoluble in alcohol; odorless; cooling, then alkaline taste.

Action and Uses.—Sodium salts are less depressing to the heart, less readily absorbed, less diuretic than potassium salts. *External:* Applied in powder or in mass with water it relieves the pain of burns, poison ivy, and skin diseases; in dilute solution it relieves itching. *Alimentary canal:* **Antacid,** used after meals for sour eructations, headache from acid dyspepsia, heartburn; while it relieves for the time being, its continued use augments acidity; cause should be removed if possible. It has some **sedative** effect on the nerves and lessens pain; used in gastric cramps, colic, in acid diarrhea of infants. Given before meals it stimulates the secretion of the acid gastric juice and is used in atony of the stomach. *Kidneys:* In large doses it sometimes relieves or prevents diabetic coma and reduces the excretion of sugar. **Diuretic** but not as good as the potassium salt because it is not absorbed as much and the urates formed are not as soluble as the potassium urates.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

SODII BISULPHIS.

Synonym.—Sodium bisulphite. *Formula:* $NaHSO_3$.

Source.—From a solution of sodium carbonate by saturating with sulphur dioxide and crystallizing.

Description. — Opaque, prismatic crystals, or granular powder; loses sulphur dioxide and changes to sulphate on exposure; soluble in 3.5 parts of water and 70 of alcohol; odor and taste of sulphur dioxide.

Action and Uses.—Similar to sodium sulphite.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

SODII BORAS.

Synonyms.—Sodium borate, Sodium bi-, tetra-, or pyroborate, Borax. *Formula:* $Na_2B_4O_7 . 10H_2O$.

Source.—Found in nature, but largely made from crude boric acid.

Description.—Colorless, transparent, monoclinic prisms, or white powder; slightly efflorescent, alkaline; soluble in 20.4 parts of water, insoluble in alcohol; odorless; sweetish, cooling, alkaline taste.

Action and Uses.—See boric acid.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

SODII BROMIDUM.

Synonym.—Sodium bromide. *Formula:* NaBr.

Source.—Similar to potassium bromide.

Description.—White or colorless, cubical crystals, or white, granular powder; attracts moisture without deliquescing; permanent in dry air, soluble in 1.7 parts of water and 12.5 of alcohol; odorless; taste very similar to sodium chloride.

Action and Uses.—Similar to potassium bromide, but not so depressing.

Dose.—2 to 60 gr. (0.12 to 4 Gm.).

SODII CARBONAS.*

Synonyms.—Sodium carbonate, Sal soda, Washing soda. *Formula:* $Na_2CO_3 . 10H_2O$.

Source.—Found in nature; largely made by the Leblanc, Solvay, and electrolytic processes.

Description. — Colorless, rhombic crystals; efflorescent changing to a white powder; soluble in 1.6 parts of water insoluble in alcohol; odorless; alkaline, caustic taste. Over one-half of this salt is water.

Action and Uses.—Similar to the monohydrated salt.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

SODII CARBONAS MONOHYDRATUS.

Synonym.—Monohydrated sodium carbonate. *Formula:* $Na_2CO_3 . H_2O$.

Source.—Crystallizing sodium carbonate at a temperature above 35° C.

Description.—White, crystalline or granular powder; nearly permanent under ordinary conditions; soluble in 2.9 parts of water, insoluble in alcohol; odorless; alkaline, caustic taste.

Action and Uses.—Similar to sodium bicarbonate, but more irritating. A solution is used locally for dry skin diseases, as psoriasis, prurigo, lichen, pruritus. Used as **antidote** to acids in preference to the bicarbonate on account of formation of less carbon dioxide. Used in boiling water to prevent the rusting of instruments in sterilizing them.

Dose.—5 to 15 gr. (0.3 to 1 Gm.).

SODII CHLORAS.

Synonym.—Sodium chlorate. *Formula:* $NaClO_3$.

Source.—From potassium chlorate by adding a solution of sodium bitartrate to it, the cream of tartar being precipitated.

Description. — Colorless, transparent crystals, cubes or modified forms, or a crystalline powder; permanent; soluble in 1 part of water and about 100 of alcohol. It may cause explosion when rubbed with oxidizable matter.

Action and Uses.—Similar to potassium chlorate.

Dose.—2 to 10 gr. (0.12 to 0.6 Gm.).

SODII CHLORIDUM.

Synonyms.—Sodium chloride, Common or Table salt. *Formula:* NaCl.

Source.—Found in nature.

Description.—Transparent, colorless, cubical crystals, or crystalline powder; permanent in dry air, decrepitates on

heating; soluble in 2.8 parts of water, nearly insoluble in alcohol; odorless; saline taste. Commercial salt is sometimes deliquescent from the magnesium chloride in it.

Action and Uses.—One of the most important constituents of the body, occurring in all fluids and tissues; aids in keeping albuminous substances in solution. In the body potassium salts decompose it. *External:* In dilute solution it is non-irritating and has a soothing, stimulating effect upon inflamed mucous membrane; used for sore throat, nasal catarrh, ozena, hives, pruritus, indolent ulcers, stings of bees, some skin diseases; sea-bathing is stimulating. Strong solutions and the dry salt act as an **antiseptic** by withdrawing water; are irritating and astringent. Hot salt in bags is a good means of applying heat. *Alimentary canal:* Small doses are **tonic,** aiding digestion by making food more palatable, aiding absorption, and increasing the saliva and gastric juice. Salty food tends to prevent alcoholic intoxication and salt enemas are used to arouse drunkards. A strong solution (1 to 2 tablespoonfuls in one-half pint of luke-warm water) is a prompt **emetic,** acting by irritation; used to unload the stomach or in case of poisoning. Used as an **anthelmintic** by rectal injection for thread-worms; used for irrigating the intestine in auto-infection. *Circulation:* A 0.6 per cent. to 0.9 per cent. sterilized aqueous solution is known as **normal saline solution** or physiological saline solution and is used by intravenous injection in case of profuse bleeding, in Asiatic cholera, in profound shock from injury, drug narcosis, uremic or diabetic coma; the amount injected varies from 1 to 4 pints. Sometimes used in hemoptysis. Antiperiodic and diuretic. Metabolism is lessened. Antidote to silver nitrate.

Dose.—2 to 8 ℥ (8 to 30 Gm.) as emetic.

SODII CITRAS.

Synonym.—Sodium citrate. *Formula:* $2Na_3C_6H_5O_7.\ 11H_2O$

Source.—From citric acid by neutralizing with sodium carbonate and crystallizing.

Description.—White, granular powder; efflorescent in dry air; soluble in 1.1 parts of water, nearly insoluble in alcohol; odorless; cooling, saline taste.

Action and Uses.—Similar to potassium citrate.

Doses.—5 to 30 gr. (0.3 to 2 Gm.) as diuretic; 4 to 8 ʒ (15 to 30 Gm.) as laxative.

SODII HYDROXIDUM.

Synonyms.—Sodium hydroxide or hydrate, Caustic soda. *Formula:* NaOH.

Source.—From sodium carbonate, similar to potassium hydroxide; also electrolytically.

Description.—White pencils or masses, showing crystalline fracture; absorbs moisture and carbon dioxide, forming sodium carbonate, and may then become efflorescent; soluble in 1 part of water, very soluble in alcohol; odorless; strongly alkaline, caustic taste.

Action, Uses, Doses, and Toxicology.—Similar to potassium hydroxide, but not so depressing.

SODII HYPOPHOSPHIS.

Synonym.—Sodium hypophosphite. *Formula:* NaH_2PO_2. H_2O.

Source.—From calcium hypophosphite by precipitating a solution with a solution of sodium carbonate, filtering and evaporating.

Description.—White, granular powder, or small, colorless, transparent, rectangular plates; oxidized on exposure to air; deliquescent; soluble in 1 part of water and 25 of alcohol; odorless; bitter-sweet, saline taste. Should not be mixed dry with oxidizing agents, as nitrates or chlorates.

Action and Uses.—Similar to calcium hypophosphite, but more particularly used in the early stages of phthisis.

Dose.—5 to 15 gr. (0.3 to 1 Gm.).

SODII IODIDUM.

Synonym.—Sodium iodide. *Formula:* NaI.

Source.—Similar to potassium iodide.

Description.—White, crystalline powder, or colorless, cubical crystals; deliquescent in moist air, frequently decomposing and becoming brown; soluble in 0.5 part of water and 3 parts of alcohol; odorless; bitter, saline taste.

Action and Uses.—Similar to potassium iodide, but less active, less toxic, less likely to produce eruption.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

SODII NITRAS.

Synonyms.—Sodium nitrate, Cubic nitre, Chile saltpetre. *Formula:* $NaNO_3$.

Source.—Found in nature.

Description.—Transparent, colorless, rhombohedral crystals; permanent in dry air, somewhat hygroscopic in moist air; soluble in 1.1 parts of water and 100 of alcohol; odorless; cooling, saline taste.

Action and Uses.—Similar to potassium nitrate, but rarely used in medicine.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

SODII NITRIS.

Synonym.—Sodium nitrite. *Formula:* $NaNO_2$.

Source.—From sodium nitrate by heating with charcoal, starch, or similar matter, then treating with water, and concentrating.

Description.—White, opaque pencils or masses, or hexagonal crystals; deliquescent and gradually changing to nitrate; soluble in 1.4 parts of water, nearly insoluble in alcohol; odorless; saline taste.

Action and Uses.—Similar to amyl nitrite, but much slower and prolonged; does not cause so much throbbing headache as nitroglycerin. Used in making spirit of nitrous ether.

Dose.—½ to 3 gr. (0.03 to 0.18 Gm.).

SODII PHENOLSULPHONAS.

Synonyms.—Sodium sulphonate, Sodium sulphocarbolate, Sodium paraphenolsulphonate. *Formula:* $NaC_6H_5O_4S.2H_2O$.

Source.—From phenol by heating with sulphuric acid on water-bath for some hours, neutralizing with barium carbonate, then precipitating the barium with sodium carbonate, leaving the sodium sulphocarbolate in solution; this is then evaporated and crystallized.

Description.—Colorless, transparent, rhombic prisms, somewhat efflorescent, soluble in 4.8 parts of water, in about 130 of alcohol; odorless; cooling, saline, bitter taste.

Action and Uses.—Introduced into medicine because it is less irritating and toxic than phenol, and it was thought that it would be broken up in the intestine forming phenol, but such is not the case. It is less antiseptic than phenol. In about a 1 per cent. solution it is used locally for inflammations of mucous membranes, tonsillitis, diphtheria, vaginitis, urethritis, gonorrhea; sometimes as an intestinal antiseptic for fermentative dyspepsia, typhoid fever, septicemia, puerperal fever, eruptive fevers.

Dose.—2 to 15 gr. (0.12 to 1 Gm.).

SODII PHOSPHAS.

Synonyms.—Sodium phosphate, Sodium acid phosphate, Disodium hydrogen phosphate. *Formula:* $Na_2HPO_4.12H_2O$.

Source.—From bone ash by treating with sulphuric acid, forming calcium acid phosphate, which is treated with sodium carbonate, filtered, evaporated, and crystallized.

Description.—Large, colorless, monoclinic prisms, or granular, crystalline powder; liquefies at about 35° C.; efflorescent; slowly absorbing carbon dioxide; soluble in 5.5 parts of water, insoluble in alcohol; odorless; cooling, saline taste.

Action and Uses.—It is a saline **purgative** like Rochelle salt; of particular benefit in affections of the liver, hepatic cirrhosis, hepatic diabetes, catarrhal jaundice, bilious sick headache, gouty dyspepsia, obesity, catarrh of stomach and intestines. The effervescing salt is more palatable.

Dose.—¼ to 2 ʒ (1 to 8 Gm.) as laxative; 2 to 8 ʒ (8 to 30 Gm.) as purgative.

SODII PHOSPHAS EXSICCATUS.

Synonym.—Dried or Anhydrous sodium phosphate. *Formula:* Na_2HPO_4.

Source.—Sodium phosphate by allowing to effloresce and heating on water-bath.

Description.—A white powder, hygroscopic.

Action and Uses.—Similar to sodium phosphate.

Dose.—One-half as much as the crystallized salt.

SODII PYROPHOSPHAS.

Synonym.—Sodium pyrophosphate. *Formula:* $Na_4P_2O_7 \cdot 10H_2O$.

Source.—From sodium phosphate by allowing to effloresce, then heating to a dull-red heat, and crystallizing from an aqueous solution.

Description.—Colorless, transparent, monoclinic crystals, or crystalline powder; slightly efflorescent; slowly converted into a phosphate by boiling with water and a mineral acid; soluble in 11.5 parts of water, insoluble in alcohol; odorless; cooling, saline, slightly alkaline taste.

Action and Uses.—Similar to sodium phosphate, but more active. Rarely used in medicine.

Dose.—About two-thirds that of sodium phosphate.

SODII SALICYLAS.

Synonym.—Sodium salicylate. *Formula:* $NaC_7H_5O_3$.

Source.—From salicylic acid by nearly neutralizing with a solution of sodium bicarbonate.

Description.—White, microcrystalline powder, small scales, or an amorphous, colorless powder, not having more than a faint pink tinge; soluble in 0.8 part of water and 5.5 parts of alcohol; odorless; sweetish, disagreeable taste. On exposure it slowly gets red and brown, due to oxidized products, but nearly permanent if the salt is a little acid. Contact with iron should be avoided, as a discoloration takes place; an aqueous solution with ferric chloride gives a violet color.

Action and Uses.—Similar to salicylic acid, but more soluble, less irritating to the stomach, and preferred for internal administration.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

SODII SULPHAS.

Synonyms.—Sodium sulphate, Glauber's salt. *Formula:* $Na_2SO_4 . 10H_2O$.

Source.—Occurs in nature and is largely obtained as a bi-product in the manufacture of some chemicals.

Description.—Large, colorless, transparent, monoclinic prisms, or granular crystals; efflorescent; soluble in 2 parts of water, insoluble in alcohol; odorless; disagreeable, bitter, saline taste.

Action and Uses.—Hydragogue **cathartic**, increasing the secretions from the intestine by acting on the glands, and preventing the absorption of the liquids; also stimulates the liver and pancreas. Used in acute constipation, hepatic torpor, intestinal indigestion, febrile conditions. Best taken in hot water before breakfast. Has been supplanted by magnesium sulphate, which is not so disagreeable.

Dose.—2 to 8 ℥ (8 to 30 Gm.).

SODII SULPHIS.

Synonym.—Sodium sulphite. *Formula:* Na_2SO_3. $7H_2O$.

Source.—Formed by passing sulphur dioxide into a solution of sodium carbonate until just acid.

Description.—Colorless, transparent, monoclinic prisms; efflorescent and slowly changed to sulphate; soluble in 2 parts of water, nearly insoluble in alcohol; odorless; cooling, sulphurous taste.

Action and Uses.—Sodium sulphite, bisulphite, and thiosulphate all act as mild **antiseptics** by withdrawing oxygen from organic matter and in the stomach some sulphur dioxide is liberated. Sodium sulphite in solution is used in aphth stomatitis, ulcers of the tonsils, cancers, parasitic skin diseases, as scabies and favus, gastric fermentation of starchy food.

Dose.—10 to 60 gr. (0.6 to 4 Gm.).

SODII THIOSULPHAS.

Synonyms.—Sodium thiosulphate, incorrectly Sodium hyposulphite. *Formula:* $Na_2S_2O_3$. $5H_2O$.

Source.—Obtained from calcium thiosulphate, which is formed as a biproduct in purifying illuminating gas, also made by boiling a solution of sodium sulphite with sulphur.

Description.—Colorless, transparent, monoclinic crystals, slightly efflorescent, soluble in 0.35 part of water, insoluble in alcohol; odorless; cooling, bitter, and nauseous taste.

Action and Uses.—Similar to sodium sulphite. Chiefly used in treating parasitic skin diseases; used for pruritus and poisoning by poison ivy.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

1. AQUA AMMONIÆ. 2. AQUA AMMONIÆ FORTIOR.

Synonyms.—(1) Ammonia-water, Spirit of hartshorn, Ammonium hydroxide. (2) Stronger ammonia-water. *Formula:* NH_4OH.

Source.—From ammonium chloride by heating with lime and water.

Description.—Ammonia-water is a colorless, transparent liquid, losing ammonia on exposure; contains 10 per cent. by weight of gas; sp. gr. 0.958; characteristic odor; alkaline, caustic taste. Stronger water of ammonia contains 28 per cent. by weight of gas, and has a sp. gr. of 0.897.

Action and Uses.—The 10 per cent. solution is generally used in medicine. *External:* Produces redness and burning sensation and if prevented from escaping it produces blisters which are painful and slow to heal; penetrates more rapidly and deeply than fixed alkalies, but does not corrode the tissues. Often used in liniments as a **counterirritant** for neuralgia, rheumatism, bruises, sprains, pruritus; relieves insect bites and stings, perhaps by neutralizing the formic acid; **antidote** to snake-bites, but probably has little effect except as a stimulant, as it does not destroy the toxalbumins; used in hair tonics to prevent the falling out of hair; very dilute solution has been used on burns and to sponge the body in cases of exhaustion. By inhalation it irritates and stimulates the mucous membrane, increasing secretion, reflexly stimulating circulation and respiration; when concentrated it produces coughing, spasm of the glottis, swelling of the mucous membranes. *Alimentary canal:* Saliva is increased slightly by reflex action. Given in small doses before meals it increases secretion of gastric juice, aiding digestion; given after meals it lessens excessive acidity. It reflexly stimulates circulation and respiration. *Nervous system:* The central nervous system is stimulated, particularly the medulla and cord; much more when injected than when taken by the stomach. Used in nervous headache, to counteract alcoholic intoxication. *Circulation:* Ammonia is a strong cardiac stimulant when inhaled or when given by stomach or by subcutaneous or intravenous injection; effect soon passes off. Stimulates vasomotor centre, contracting the bloodvessels and raising blood pressure; tends to lessen coagulation of blood. It is often used as a **cardiac stimulant** in cases of fainting, syncope, asphyxia, narcosis, poisoning, or weak heart. If given by inhalation great care must be used not to give it

too strong; the administrator may try it on himself occasionally. *Respiration:* Momentarily checked, then becomes fuller and deeper; **expectorant**, not used as much as the carbonate. *Kidneys:* In the body ammonia is converted into urea and quickly eliminated in the urine as such; the amount of urine is generally increased. Sweat is sometimes increased. **Antidote** to poisoning by chlorine, hydrocyanic acid, alcoholic intoxication. The aromatic spirit is the best form for internal administration.

Toxicology.—It may produce suffocation by the intense inflammation of the respiratory tract, or gastro-enteritis if taken internally, with symptoms of collapse, as cold, clammy, skin; weak pulse, labored respiration, coma. In treating give weak vegetable acids, demulcent drinks, fixed oils, stimulants, as brandy, strychnine, digitalis.

Preparations and Doses.—Water and Spirit, 5 to 30 ♏ (0.3 to 2 Cc.). Aromatic spirit, 5 to 60 ♏ (0.3 to 4 Cc.). Liniment.

AMMONII BENZOAS.

Synonym.—Ammonium benzoate. *Formula:* $NH_4C_7H_5O_2$.

Source.—From benzoic acid by making alkaline with ammonia water, evaporating, keeping the liquid alkaline.

Description.—White, thin, laminar crystals, or crystalline powder; gradually losing ammonia and becoming acid on exposure; soluble in 10.5 parts of water and 25 of alcohol; odorless or having a slight odor of benzoic acid; saline, somewhat bitter, then acrid taste.

Action and Uses.—Similar to benzoic acid; chiefly used in phosphaturia and cystitis due to alkaline urine.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

AMMONII BROMIDUM.

Synonym.—Ammonium bromide. *Formula:* NH_4Br.

Source.—From hydrobromic acid by neutralizing with ammonia and evaporating, or by adding ammonia to a solution of ferrous bromide, filtering and evaporating.

Description.—Colorless, transparent, prismatic crystals, or a white, crystalline powder; permanent in dry air; sublimes with heat; soluble in 1.2 parts of water and 12.5 of alcohol; odorless; pungent, saline taste.

Action and Uses.—Similar to potassium bromide, but is slightly stimulating rather than depressing; it is more likely to produce irritation of the stomach; given in combination with other bromides its action is said to be stronger.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

AMMONII CARBONAS.

Synonyms.—Ammonium carbonate, Sesquicarbonate of ammonium, Sal volatile, Volatile salt or alkali. *Formula:* $NH_4HCO_3NH_4NH_2CO_2$.

Source.—From ammonium chloride by heating with calcium carbonate, the ammonium carbonate subliming.

Description.—Hard, white, translucent, striated masses; soluble in 4 parts of water; the carbamate is soluble in alcohol, but not the bicarbonate; strong odor of ammonia; sharp, saline, alkaline taste. The official salt is a mixture of ammonium bicarbonate and ammonium carbamate and on exposure loses ammonia and carbon dioxide, leaving the bicarbonate in the form of opaque, friable masses or a white powder. Only the translucent masses should be used for dispensing.

Action and Uses.—Similar to ammonia-water. Not used externally as much as the water, but more internally. *Alimentary canal:* Small doses cause some irritation and stimulation of the stomach; given before meals it increases secretion of gastric juice and is used as a **tonic** in dyspepsia; given after meals it neutralizes acidity and is used as an **antacid** and **carminative** in heartburn, in headache due to acidity and flatulence. With capsicum and other agents it relieves the craving of drunkards, dissolves the mucus in the stomach, and aids digestion. Large doses produce irritation, vomiting, and purging; used as a stimulating **emetic** in cases of narcotic poisoning. *Circulation and Nervous System:* Stimulant, similar to ammonia-water. *Respiratory tract:* Respiration is stimu-

lated by reflex action and by stimulation of the medullary centre, increases secretion and makes it thinner; stimulating **expectorant**, frequently used in different forms of bronchitis, croupous and catarrhal pneumonia.

Preparations and Doses.—2 to 10 gr. (0.12 to 0.6 Gm.) as expectorant; 10 to 30 gr. (0.6 to 2 Gm.) as emetic. Aromatic spirit of ammonia, 15 to 60 ♏ (1 to 4 Cc.).

AMMONII CHLORIDUM.

Synonyms.—Ammonium chloride, Sal ammoniac, Muriate of ammonia. *Formula:* NH_4Cl.

Source.—From gas-liquor which is a biproduct in the manufacture of illuminating gas. The liquor is distilled with lime, the gas passed into sulphuric acid, and the ammonium sulphate heated with sodium chloride, the ammonium chloride subliming.

Description.—White, crystalline powder; permanent; soluble in 2 parts of water and 50 of alcohol; odorless; cooling, saline taste.

Action and Uses.—External: A solution is used for sprains and bruises, is said to remove ecchymoses; used for ulcers, prurigo, leucorrhea; applied in the form of vapor or a spray to a mucous membrane it stimulates it and increases secretion. *Alimentary canal:* Moderate doses have but little effect upon the stomach; it is a **cholagogue**, used for so-called "biliousness," hepatic torpor, catarrhal jaundice, cirrhosis of the liver, gastric catarrh. *Circulation:* But little effect when taken into the stomach; injected hypodermically it is a stimulant like ammonia. *Respiratory tract:* Taken internally it is eliminated through the mucous membrane, increasing secretion and making it less tenacious; has the same effect if applied locally; used as an **expectorant** for pharyngitis, laryngitis, bronchitis, croupous pneumonia. It frequently very markedly relieves alcoholic intoxication. Used to relieve rheumatism, neuralgia, sciatica, myalgia, dysmenorrhea. Eliminated in urine, largely unchanged; urea is increased, also the urine and sweat.

Preparations and Doses.—1 to 20 gr. (0.06 to 1.3 Gm.). Troches.

AMMONII IODIDUM.

Synonym.—Ammonium iodide. *Formula:* NH_4I.

Source.—From potassium iodide by boiling with a solution of ammonium sulphate, cooling, adding alcohol, filtering out potassium sulphate, and evaporating.

Description.—Small, colorless, cubical crystals, or white, granular powder; hygroscopic, soon becoming brown on account of iodine liberated; soluble in 0.6 part of water and 9 of alcohol; odorless unless colored, when it has an iodine odor; sharp, saline taste. Should not be used if much colored; the color can be removed by the addition of a little ammonia.

Action and Uses.—Similar to potassium iodide; less depressing to the heart, but more irritating to the mucous membranes.

Dose.—2 to 10 gr. (0.12 to 0.6 Gm.).

AMMONII SALICYLAS.

Synonym.—Ammonium salicylate. *Formula:* $NH_4C_7H_5O_3$.

Source.—From salicylic acid by nearly neutralizing it with ammonia water and evaporating.

Description.—Colorless, lustrous, monoclinic prisms or plates, or a white, crystalline powder; permanent when slightly acid, turning red if alkaline; soluble in 0.9 part of water and 2.3 parts of alcohol; odorless; saline, bitter-sweet taste.

Action and Uses.—Similar to salicylic acid; also has some expectorant properties.

Dose.—2 to 15 gr. (0.12 to 1 Gm.).

AMMONII VALERAS.

Synonyms.—Ammonium valerate or valerianate. *Formula:* $NH_4C_5H_9O_2$.

Source.—From valeric acid by passing dry ammonia gas into it.

Description.—Colorless or white, quadrangular plates; deliquescent in moist air; very soluble in water and alcohol; odor of valeric acid; sharp, sweetish taste.

Action and Uses.—Used chiefly in **nervous conditions** of women, hysteria, epilepsy, chorea, insomnia; similar to valerian, but probably of little benefit.

Dose.—2 to 10 gr. (0.12 to 0.6 Gm.).

LITHII BENZOAS.

Synonym.—Lithium benzoate. *Formula:* $LiC_7H_5O_2$.

Source.—From lithium carbonate by decomposing with benzoic acid.

Description.—Small, shining, crystalline scales, or light, white powder; permanent; soluble in 3 parts of water and 13 of alcohol; odorless or faint benzoic acid odor; cooling, sweetish taste.

Action and Uses.—Similar to benzoic acid; in gouty and rheumatic conditions.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

LITHII BROMIDUM.

Synonym.—Lithium bromide. *Formula:* LiBr.

Source.—From lithium carbonate by neutralizing with hydrobromic acid, or from ferrous bromide by the addition of lithium carbonate, filtering out the iron carbonate and evaporating the filtrate.

Description.—White, granular powder; very deliquescent soluble in 0.6 part of water, very soluble in alcohol; odorless sharp, slightly bitter taste.

Action and Uses.—Similar to potassium bromide, claimed by some to be more hypnotic.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

LITHII CARBONAS.

Synonym.—Lithium carbonate. *Formula:* Li_2CO_3.

Source.—From a silicate by a somewhat complicated process.

Description.—Light, white powder; permanent; soluble in 75 parts of water, insoluble in alcohol; odorless; alkaline taste.

Action and Uses.—Lithium salts come next to potassium salts in depressing effects. The urine is increased and made strongly alkaline. Lithium urates are more soluble than urates of other bases. Outside the body lithium carbonate dissolves uric acid freely, but in the body it has a greater affinity for the acid phosphates. It is of benefit in making the urine alkaline and usually a large amount of water is taken, which flushes the kidneys. Used as **antacid** and **diuretic** in gout, rheumatism, cystitis, and to dissolve calculi, but probably is useless in the last case.

Dose.—2 to 15 gr. (0.12 to 1 Gm.).

LITHII CITRAS.

Synonym.—Lithium citrate. *Formula:* $Li_3C_6H_5O_7$. $4H_2O$.

Source.—From lithium carbonate by adding a solution of citric acid to neutralization.

Description.—White powder or colorless crystals; deliquescent in moist air; soluble in 2 parts of water, nearly insoluble in alcohol; odorless; cooling, slightly alkaline taste.

Action and Uses.—Same as lithium carbonate.

Dose.—5 to 30 gr. (0.3 to 2 Gm.). Effervescent lithium citrate, 1 to 2 ʒ (4 to 8 Gm.).

LITHII SALICYLAS.

Synonym.—Lithium salicylate. *Formula:* $LiC_7H_5O_3$.

Source.—From lithium carbonate by adding an excess of salicylic acid in the presence of water.

Description.—White or grayish-white powder; deliquescent; very soluble in water and alcohol; odorless; sweetish taste. Should not come in contact with iron, which colors it.

Action and Uses.—Similar to sodium salicylate and salicylic acid.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

MAGNESII CARBONAS.

Synonyms.—Magnesium carbonate, Magnesia alba, Light magnesium carbonate. *Formula:* $(MgCO_3)_4$. $Mg(OH)_2$. $5H_2O$.

Source.—From a solution of magnesium sulphate by precipitating with a solution of sodium carbonate, the solutions being cold and dilute.

Description.—Light, white, friable masses, or a light, white powder; permanent; nearly insoluble in water, insoluble in alcohol; odorless; slightly earthy taste.

Action and Uses.—In the alimentary canal it neutralizes acidity, forming some magnesium chloride and carbon dioxide, which in small amounts is sedative to the inflamed membrane. **Antacid** in heartburn, sick headache from acidity of stomach, vomiting of pregnancy, indigestion with flatulence in infants. In the intestine the salts and carbon dioxide formed by the acids of the stomach act as a mild **laxative**, used in constipation. A small amount is absorbed, making the blood more alkaline and the urine less acid, and slightly increasing the amount of urine; given for rheumatism and gout, but not as good as the alkalies. **Antidote** for poisoning by acids (but not as good as the oxide because of the carbon dioxide), arsenic, alkaloids, some salts. Used as a cosmetic, and as a dusting powder for chafing.

Dose.—15 to 60 gr. (1 to 4 Gm.).

MAGNESII OXIDUM.

Synonyms.—Magnesium oxide, Magnesia, Calcined magnesia. *Formula:* MgO.

Source.—From magnesium carbonate by heating to a dull red.

Description.—A white, bulky, fine powder; slowly absorbs moisture and carbon dioxide on exposure; nearly insoluble in water, insoluble in alcohol; odorless; slightly earthy taste. Mixed with 15 parts of water and allowed to stand, it forms a gelatinous mass.

Action and Uses. — Similar to magnesium carbonate. Should be mixed with about 20 parts of water to convert it into the hydroxide before being taken.

Dose.—15 to 45 gr. (1 to 3 Gm.).

MAGNESII OXIDUM PONDEROSUM.

Synonyms.—Heavy magnesium oxide, Heavy magnesia. *Formula:* MgO.

Source.—From heavy magnesium carbonate by heating to a dull-red heat.

Description.—A dense, white powder, that does not readily unite with water to make a gelatinous hydroxide.

Action, Uses, and Dose.—Same as magnesium oxide.

MAGNESII SULPHAS.

Synonyms.—Magnesium sulphate, Epsom salt, Salts, Sal amarum. *Formula:* $MgSO_4$. $7H_2O$.

Source.—From impure magnesium carbonate or native sulphate.

Description.—Small, colorless, prismatic needles, or rhombic prisms; slowly efflorescent; soluble in 0.85 part of water, insoluble in alcohol; odorless; cooling, saline, bitter taste.

Action and Uses.—One of the best and most used of **saline purgatives,** producing a large, watery stool without much nausea or griping, usually within a couple of hours; acting by stimulation of the intestinal glands, withdrawing water from the blood, and preventing absorption of fluids. Used in habitual constipation, gout, intestinal obstruction, lead colic, dropsy, tropical dysentery, bleeding hemorrhoids, uterine hemorrrhage; being non-irritating it can be given when inflammation of the canal is present. Best taken in water by sipping before breakfast; may be taken by enema or by hypodermic injection, though there is some danger of poisoning by injection. Chief ingredient in Hunyadi and other laxative waters. May be given with coffee to mask taste or in the form of the effervescent salt.

Preparations and Doses.—1 to 8 ʒ (4 to 30 Gm.). Effervescing magnesium sulphate, ½ to 1 ʒ (15 to 30 Gm.). Compound infusion of senna, 2 to 8 ʒ (8 to 30 Cc.).

TALCUM.

Synonyms.—Talc, Soapstone, French chalk, Magnesium silicate (impure). *Formula:* $4MgO.\ 5SiO_2.\ H_2O$, approximately.

Source.—A native compound. The purified is obtained by treating talc with hydrochloric acid and washing.

Description.—White or grayish-white powder; permanent greasy sensation when rubbed on the skin; insoluble in water or alcohol; odorless; tasteless.

Action and Uses.—Only the purified should be used in medicine. Used as a dusting powder and **protective** to relieve itching of prickly heat and other skin diseases; a common base for face powders. Used in pharmacy to clarify liquids.

CALCII BROMIDUM.

Synonym.—Calcium bromide. *Formula:* $CaBr_2$.

Source.—From hydrobromic acid by neutralizing with calcium carbonate, filtering, and evaporating.

Description.—White, granular salt; very deliquescent; soluble in 0.5 part of water and 1 of alcohol; odorless; sharp, saline taste.

Action and Uses.—Similar to potassium bromide, but not so depressing; not used much.

Dose.—5 to 60 gr. (0.3 to 4 Gm.).

CALCII CARBONAS PRÆCIPITATUS.

Synonyms.—Precipitated calcium carbonate, Precipitated chalk. *Formula:* $CaCO_3$.

Source.—From calcium chloride by precipitating a solution of it with a solution of ammonium or sodium carbonate.

Description.—Fine, white powder; permanent; nearly insoluble in water and alcohol; odorless; tasteless.

Action and Uses.—External: Astringent and drying powder, used for moist eczema, burns, abrasions, ulcers, excessive sweating. Base of most tooth powders; good on account of its cleansing and antacid properties. *Internal:* **Antacid** for excessive acidity of stomach, particularly good for diarrhea due to acid fermentation in children. Very little is absorbed. Antidote for oxalic acid poisoning.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

CRETA PRÆPARATA.

Synonym.—Prepared chalk. *Formula:* $CaCO_3$.

Source.—Native calcium corbonate, freed from most impurities by elutriation.

Description.—White or grayish-white, amorphous powder; finer and smoother than precipitated chalk; sometimes in the form of conical masses; other properties same as precipitated chalk.

Action, Uses, and Doses.—Similar to precipitated chalk, but preferred on account of its fineness.

CALCII CHLORIDUM.

Synonym.—Calcium chloride. *Formula:* $CaCl_2$.

Source.—From native calcium carbonate by dissolving in hydrochloric acid and purifying.

Description.—White, hard fragments; deliquescent; soluble in 1.3 parts of water and 8 of alcohol; odorless; sharp, saline taste. U. S. P. calls for the anhydrous salt, and this is liable to have a little insoluble matter in it.

Action and Uses.—External: Hastens the coagulation of blood and makes the clot harder. *Internal:* **Astringent** in the gastro-intestinal canal, used in colliquative diarrhea. Used in bronchitis, pneumonia; **hemostatic** in hemoptysis, hematemesis, hemophilia, uterine hemorrhage. Resolvent for glandular swellings.

Dose.—5 to 20 gr. (0.3 to 1. 3 Gm.).

CALCII HYPOPHOSPHIS.

Synonym.—Calcium hypophosphite. *Formula:* $Ca(PH_2O_2)_2$.

Source.—From phosphorus by heating with lime and water.

Description.—Colorless, transparent prisms, lustrous scales, or white, crystalline powder; permanent; soluble in 6.5 parts of water, insoluble in alcohol; odorless; nauseous, bitter taste. Often contains a little matter that is not soluble.

Action and Uses.—The hypophosphites were supposed to have the effect of phosphorus without the irritation and to be converted into phosphates, aiding digestion. Later experiments go to show that nearly all of the hypophosphite given is eliminated unchanged. Hypophosphites are used as **tonics** in anemia, weakness, phthisis, suppuration, nervous and general debility, malnutrition, and chronic lung diseases, and to promote the growth of bones.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

CALCII PHOSPHAS PRÆCIPITATUS.

Synonym.—Precipitated calcium phosphate. *Formula:* $Ca_3(PO_4)_2$.

Source.—From bone-ash by dissolving in hydrochloric acid and precipitating with ammonia, washing out the ammonium chloride.

Description.—Light, white amorphous powder; permanent; insoluble in water and alcohol; odorless; tasteless.

Action and Uses.—Used in rickets, tuberculosis, pregnant and nursing women, scrofula, fractured bones; in pharmacy as a diluent and a clarifying agent.

Dose.—5 to 30 gr. (0.3 to 2 Gm.). Syrup of calcium lactophosphate, 1 to 4 ℥ (4 to 15 Cc.).

CALCII SULPHAS EXSICCATUS.

Synonyms.—Dried calcium sulphate, Dried gypsum Plaster of Paris. *Formula:* $(CaSO_4)_2 . H_2O$, approximately.

Source.—From native gypsum by heating.

Description.—Amorphous, white powder; absorbs moisture, forming small lumps; mixed with one-half its weight of water it makes a mass that soon hardens; soluble in about 378 parts of water, insoluble in alcohol; odorless; tasteless.

Uses.—In surgery for immobilizing parts, and for making casts and supports. Never used internally.

CALX.

Synonyms.—Calcium oxide, Lime, Quicklime. *Formula:* CaO.

Source.—From marble or calcium carbonate by calcining.

Description.—Hard, white or dirty white lumps; absorbs carbon dioxide and water from the air, forming a powder containing calcium carbonate and hydroxide; soluble in about 760 parts of water, insoluble in alcohol; produces heat when

sprinkled with half its weight of water; odorless; alkaline, caustic taste.

Action and Uses.—External: Decomposes organic matter; **disinfectant,** for feces, urine, drains, cesspools. Applied to tissue with a small amount of water it destroys it; **caustic,** less active than the alkali hydroxides, generally applied with potassium hydroxide; used for indolent ulcers, favus. Lime-water is used as an **astringent** and **sedative** in itching skin diseases; in parasitic skin diseases, as scabies; to break down false membrane in diphtheria and croup; injection in leucorrhea and gleet. *Internal:* Lime-water is **antacid** in acid dyspepsia; with milk it prevents the formation of large coagula; **tonic,** aiding the digestion of milk and increasing secretion of gastric juice; **anti-emetic,** relieving vomiting and nausea from gastric irritability; astringent for diarrhea; anthelmintic against thread-worms; antidote for oxalic acid and mineral acids.

Preparations and Doses.—Solution $\frac{1}{4}$ to 2 ℥ (8 to 60 Cc.). Syrup, 15 to 60 ♏ (1 to 4 Cc.). Liniment.

CALX CHLORINATA.

Synonyms.—Chlorinated lime, Chlorinated calcium oxide, Chloride of lime (misnomer), Bleaching powder, Calcium hypochlorite. *Formula:* None can be given, as this is a variable mixture.

Source.—From slaked lime by passing chlorine gas into it.

Description.—White or dirty white, granular powder; absorbs moisture from the air and gradually decomposes, liberating chlorine; partly soluble in water and alcohol; odor of chlorine; disagreeable taste; contains at least 30 per cent. available chlorine.

Compound solution of chlorine (similar to chlorine-water) is made from potassium chlorate and hydrochloric acid, and contains 0.4 per cent. of chlorine with oxides of chlorine and potassium chloride. Solution of chlorinated soda (Labarraque's solution) made from chlorinated lime contains at least 2.4 per cent. available chlorine.

Action and Uses.—All three preparations depend upon chlorine for their value. Almost all acids decompose the hypochlorites in chlorinated lime and solution of chlorinated soda, liberating chlorine. *External:* Strong **antiseptic, disinfectant,** and **deodorant**; acts by combining with hydrogen, forming hydrochloric acid and liberating oxygen, which in the nascent condition is a powerful oxidizer; bleaches organic colors. Chlorinated lime is used as a disinfectant for sick rooms; sometimes placed in a saucer on a shelf (chlorine being heavier than air), the carbon dioxide of the air slowly liberates chlorine; this method is of but little value, as the amount of chlorine which the patient can bear is too small to do much good except as a deodorant and it has the disadvantage of giving a false feeling of security. Used to disinfect stools, sputa, clothing, drains, sinks, urinals, etc. A strong solution is used to disinfect the hands after contact with infectious matter. Chlorine is used to disinfect rooms after contagious diseases; room must be hermetically sealed and enough chlorine generated to make the air irrespirable; considered inferior to sulphur dioxide or formaldehyde. Chlorine applied locally in solution is an irritant and vesicant; inhaled it causes sneezing, spasm of the glottis, bronchitis, and hemorrhage. Chlorine in dilute solutions is used in aphthæ, gangrene, sloughing ulcers, foul discharges, scarlet fever, itch and other skin diseases; with ferric chloride, glycerin and water in diphtheria; as a gargle in sore throat; for snake-bites and in Australia a solution is injected in several places around the bite. *Alimentary canal:* Now rarely used. Changed quite quickly to hydrochloric acid and chlorides. Used in weak solution as a **tonic** and antiseptic to prevent fermentation; sometimes in the diarrhea of typhoid fever; said to be a good stimulant in low fevers. *Toxicology:* Large doses cause intense inflammation and corrosion, followed by collapse. Give dilute alkalies to neutralize the acid, albuminous demulcents, narcotics and stimulants **as** needed. In case chlorine is inhaled, let the patient inhale steam or dilute ammonia, remembering that ammonia is an irritant itself.

Preparations and Doses.—Chlorinated lime, 3 to 6 gr. (0.18 to 0.36 Gm.). Solution of chlorinated soda, 5 to 30 ♏

(0.3 to 2 Cc.). Compound solution of chlorine, 30 to 60 ♏ (2 to 4 Cc.).

CALX SULPHURATA.

Synonyms.—Sulphurated lime, Impure calcium sulphide. *Formula:* This is a mixture the active part of which is calcium sulphide, CaS.

Source.—From calcium sulphate by heating with charcoal and starch.

Description.—Grayish-white powder, slowly decomposing in moist air, slightly soluble in water, insoluble in alcohol; odor of hydrogen sulphide; disagreeable, alkaline taste.

Action and Uses.—Used as a **parasiticide** for scabies, ringworm, and buboes; used in the form of a paste as a **depilatory**, but less effective than barium sulphide; in the form of baths it is used for chronic rheumatism and chronic bronchitis. *Internal:* Used for skin diseases and carbuncles.

Dose.—$\frac{1}{10}$ to 2 gr. (0.006 to 0.12 Gm.).

CALCII GLYCEROPHOSPHAS.*

Synonym.—Calcium glycerophosphate. *Formula:* $C_3H_5(OH)_2CaPO_4 . H_2O$.

Source.—From glycerophosphoric acid by neutralizing with calcium carbonate.

Description.—White, crystalline powder; slowly decomposes; soluble in 20 parts of water; odorless.

Action and Uses.—General and nervine **tonic** in wasting diseases where lime and phosphoric acid are wanted, as in neurasthenia, diabetes mellitus, sciatica, anemia, rachitis.

Dose.—2 to 10 gr. (0.12 to 0.6 Gm.).

STRONTII BROMIDUM.

Synonym.—Strontium bromide. *Formula:* $SrBr_2 . 6H_2O$.

Source.—From hydrobromic acid by neutralizing with strontium carbonate.

Description.—Colorless, transparent, hexagonal crystals; very deliquescent; soluble in 1 part of water, readily soluble in alcohol; odorless; bitter, saline taste.

Action and Uses.—Similar to potassium bromide.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

STRONTII IODIDUM.

Synonym.—Strontium iodide. *Formula:* SrI_2. $6H_2O$.

Source.—From hydriodic acid by neutralizing with strontium carbonate.

Description.—Colorless, transparent, hexagonal plates; deliquescent and becoming yellow on exposure; soluble in 0.5 part of water and in alcohol; odorless; bitter, saline taste.

Action and Uses.—Similar to potassium iodide, but less likely to cause indigestion, and less depressing.

Dose.—5 to 15 gr. (0.3 to 1 Gm.) or more.

STRONTII SALICYLAS.

Synonym.—Strontium salicylate. *Formula:* $Sr(C_7H_5O_3)_2$. $2H_2O$.

Source.—From salicylic acid by neutralizing with strontium carbonate.

Description.—White, crystalline powder; nearly permanent; soluble in 18 parts of water and 66 of alcohol; odorless; sweet, saline taste.

Action and Uses.—Similar to sodium salicylate.

Dose.—5 to 30 gr. (0.3 to 2 Gm.).

BARII CHLORIDUM.*

Synonym.—Barium chloride. *Formula:* $BaCl_2$. $2H_2O$.

Source.—From native barium sulphate by heating with charcoal, then dissolving in hydrochloric acid, evaporating, and crystallizing.

Description.—Colorless, transparent tables; permanent; soluble in about 2.5 parts of water, sparingly soluble in alcohol; odorless; disagreeable, bitter taste.

Action and Uses.—Like digitalis it slows the heart's action but increases the force, contracts the arterioles and raises the blood pressure, contracts intestinal walls and increases peristalsis. **Cardiac stimulant** in cases of heart-failure, mitral insufficiency, irregular heart; formerly used in the treatment of glandular and nervous diseases.

Dose.—$\frac{1}{10}$ to 2 gr. (0.006 to 0.12 Gm.).

BARII DIOXIDUM.*

Synonym.—Barium dioxide. *Formula:* BaO_2.

Source.—From barium oxide by heating and passing oxygen over it.

Description.—Heavy, grayish-white, coarse powder; slowly decomposed, absorbing water and carbon dioxide; slightly soluble in water; odorless; tasteless.

Use.—To make hydrogen dioxide water.

AQUA HYDROGENII DIOXIDI.

Synonyms.—Hydrogen dioxide solution, Solution of hydrogen peroxide. *Formula:* H_2O_2 (Hydrogen dioxide).

Source.—Usually made from barium dioxide by treating with phosphoric acid.

Description.—Colorless liquid; slowly liberates oxygen, but on exposure it loses chiefly water; odorless; slightly acid taste, producing a peculiar sensation in the mouth. Bottles containing it should be loosely stoppered; keeping them tightly stoppered does not prevent decomposition, and the liberation of oxygen may burst the bottle. It should contain 3 per cent. hydrogen dioxide and yield ten volumes of available oxygen. A mineral acid is generally present, as this tends to prevent decomposition.

Action and Uses.—Readily decomposed into oxygen and water by nearly all kinds of organic matter and oxidizable substances. Sometimes it is strongly acid and irritating, and should not come in contact with metallic instruments. It is a strong, non-poisonous **antiseptic**, often used where pus is present. In contact with pus it causes a frothing, a cessation of which indicates that the pus has been decomposed, but a continuation of frothing does not necessarily indicate that it is still present. Used in wounds, ulcers, carbuncles, fistulas, gonorrhea, leucorrhea, ozena, tonsillitis, eye diseases, croup, whooping-cough; one of the best agents in removing the **false** membrane of diphtheria. Used in **bleaching** hair and other substances. Used to disinfect drinking water (1 to 1000). Internally it is used in some forms of dyspepsia, to relieve dyspnea of bronchitis or the cough of phthisis.

OXYGEN is used in different diseases, as ulcers and gangrene; but chiefly in diseases of the respiratory tract, as dyspnea, emphysema, phthisis, asthma, asphyxia from poisons; of benefit in uremia, gout, diabetes, epilepsy.

Dose.—Hydrogen dioxide water, ½ to 2 ℥ (2 to 8 Cc.).

FERRUM.

Synonym.—Iron. *Formula:* Fe.

Source.—From various ores, as pyrites, magnetic iron, hæmatite.

Description.—Fine, bright, non-elastic wire is called for by the U. S. P. Card-teeth wire is frequently used, as it is pure and cheap. This is used only in making salts of iron.

FERRUM REDUCTUM.

Synonyms.—Reduced iron, Iron by hydrogen, Quevenne's iron. *Formula:* Fe.

Source.—From ferric hydroxide by heating and passing hydrogen over it.

Description.—Fine, grayish-black, lustreless powder; permanent in dry air, but oxidizing in moist air; insoluble in water or alcohol; odorless; tasteless.

FERRI SULPHAS.

Synonyms.—Ferrous sulphate, Copperas, Green vitriol. *Formula:* $FeSO_4 . 7H_2O$.

Source.—From metallic iron by dissolving in diluted sulphuric acid.

Description.—Large, pale bluish-green, monoclinic prisms; efflorescent in dry air, oxidizes in moist air; soluble in 0.9 part of water, insoluble in alcohol; odorless; styptic taste.

FERRI SULPHAS GRANULATUS.

Synonym.—Granulated ferrous sulphate. *Formula:* $FeSO_4 . 7H_2O$.

Source.—From ferrous sulphate by making a hot, concentrated solution, cooling and stirring, washing with alcohol.

Description.—Pale bluish-green, crystalline powder; otherwise similar to ferrous sulphate. More convenient at dispensing counter.

FERRI SULPHAS EXSICCATUS.

Synonym.—Dried ferrous sulphate. *Formula:* $2FeSO_4 . 3H_2O$ approximately represents it.

Description.—A grayish-white powder, slowly soluble in water. About 6.5 Gm. represents 10 Gm. of the crystallized salt. Chiefly used in pills because it is less bulky.

FERRI CARBONAS SACCHARATUS.

Synonym.—Saccharated Carbonate of iron. *Formula:* This is a mixture, the active principle being ferrous carbonate, $FeCO_3$.

Source.—From ferrous sulphate by precipitating with sodium carbonate, washing, mixing with sugar, and drying.

Description.—Greenish-brown powder, slowly oxidizing, partly soluble in water; odorless; sweet, slightly styptic taste.

FERRI LACTAS.*

Synonym.—Ferrous lactate. *Formula:* $Fe(C_3H_5O_3)_2 . 3H_2O$.

Source.—From calcium lactate by treating a solution with a solution of ferrous sulphate, filtering and evaporating.

Description.—Greenish-white powder or crusts of needles, oxidizing in moist air, soluble in about 40 parts of water, insoluble in alcohol; odorless; sweetish, styptic taste.

FERRI CHLORIDUM.

Synonyms.—Ferric chloride, Sesquichloride of iron, Perchloride of iron. *Formula:* $FeCl_3 . 6H_2O$.

Source.—From metallic iron by dissolving in hydrochloric acid, treating with nitric acid and evaporating.

Description.—Orange-yellow, crystalline masses; very deliquescent; readily soluble in water or alcohol; faint hydrochloric acid odor; strongly styptic taste.

FERRI CITRAS.

Synonym.—Ferric citrate. *Formula:* $FeC_6H_5O_7$, approximately.

Source.—From ferric hydroxide by dissolving in citric acid and water and evaporating.

Description.—Thin, transparent, red scales; permanent; slowly soluble in water, insoluble in alcohol; odorless; slightly acid and styptic taste.

FERRI ET AMMONII CITRAS.

Synonyms.—Iron and ammonium citrate, Soluble citrate of iron. *Formula:* None can be given that will represent it.

Source.—From ferric citrate by adding ammonia-water to a solution and evaporating.

Description.—Thin, transparent, red scales; deliquescent; readily soluble in water, insoluble in alcohol; odorless; ferruginous taste.

FERRI ET AMMONII SULPHAS.

Synonyms.—Iron and ammonium sulphate, Ammonio-ferric sulphate, Ammonio-ferric alum, Iron alum. *Formula:* $NH_4Fe\ (SO_4)_2.\ 12H_2O$.

Source.—Mixing solutions of ferric sulphate and ammonium sulphate, evaporating and crystallizing.

Description.—Pale violet, octahedral crystals; efflorescent; soluble in 2.7 parts of water, insoluble in alcohol; odorless; acid, styptic taste.

FERRI ET AMMONII TARTRAS.

Synonym.—Iron and ammonium tartrate. *Formula:* None can be given that will represent it.

Source.—From ferric hydroxide by dissolving in a solution of ammonium bitartrate.

Description.—Thin, transparent scales, of a red to reddish-brown color, slightly deliquescent, readily soluble in water, insoluble in alcohol; odorless; ferruginous taste.

FERRI ET POTASSII TARTRAS.

Synonyms.—Iron and potassium tartrate, Potassioferric tartrate. *Formula:* None can be given that will represent it.

Source.—From ferric hydroxide by dissolving in solution of potassium bitartrate.

Description.—Thin, transparent, red to reddish-brown scales; slightly deliquescent; readily soluble in water, insoluble in alcohol; odorless; ferruginous taste.

FERRI ET QUININÆ CITRAS.

Synonym.—Iron and quinine citrate.

Source.—From a solution of ferric citrate by the addition of a solution of quinine citrate and evaporating.

Description.—Thin, transparent, reddish-brown scales; slightly deliquescent; slowly soluble in water, partially soluble in alcohol; odorless; bitter, ferruginous taste.

FERRI ET QUININÆ CITRAS SOLUBILIS.

Synonym.—Soluble iron and quinine citrate.

Source.—From iron and quinine citrate by neutralizing with ammonia.

Description.—Thin, transparent, greenish to golden-yellow scales; deliquescent; odorless; bitter, ferruginous taste.

FERRI ET STRYCHNINÆ CITRAS.

Synonym.—Iron and strychnine citrate.

Source.—From iron and ammonium citrate by the addition of a solution of strychnine citrate.

Description.—Thin, transparent, red to yellowish-brown scales; deliquescent; readily soluble in water, partially soluble in alcohol; odorless; bitter, ferruginous taste.

FERRI HYDROXIDUM.

Synonym.—Ferric hydroxide. *Formula:* $Fe(OH)_3$.

Source.—From a solution of ferric sulphate by pouring into a solution of ammonia and washing.

Description.—Brownish-red magma; gets lighter on exposure and changes to an oxide; insoluble in water or alcohol; odorless; nearly tasteless.

FERRI HYPOPHOSPHIS.

Synonym.—Ferric hypophosphite. *Formula:* $Fe(PH_2O_2)_3$.
Source.—From a solution of ferric sulphate or chloride by the addition of sodium hypophosphite.
Description.—White or grayish-white powder; permanent; soluble in 2300 parts of water, insoluble in alcohol; odorless; nearly tasteless.

FERRI PHOSPHAS SOLUBILIS.

Synonyms.—Soluble phosphate of iron, Sodioferric citrophosphate.
Source.—From a solution of ferric citrate by the addition of a solution of sodium phosphate.
Description. — Thin, bright-green, transparent scales; darkens on exposure to light, otherwise permanent; soluble in water; odorless; acidulous, saline taste.

FERRI PYROPHOSPHAS SOLUBILIS.

Synonym.—Soluble pyrophosphate of iron.
Source.—From a solution of ferric citrate by the addition of a solution of sodium pyrophosphate.
Description. — Thin, apple-green, transparent scales; darkens on exposure to air; odorless; acidulous, saline taste.

Action and Uses of Iron Salts.—Iron is a normal constituent of the body, and can be considered a food and also a medicine. It is estimated that the body contains 40 to 50 grains, most of which is in the hemoglobin. Many articles of food contain iron in combination with organic matter. *External:* Salts of iron

combined with inorganic acids applied to the broken skin or mucous membrane coagulate albuminous fluids, thus contracting tissues, lessening the size of bloodvessels, and stopping the flow of blood. The solution of the subsulphate is generally preferred to the chloride because it contains more iron and less acid, consequently is stronger and less irritating. These salts are used as **astringents** in pharyngitis, tonsillitis, diphtheria, erysipelas, hemorrhoids, ulcers. They are used as **styptics** in hemoptysis, epistaxis, uterine hemorrhage, and hemorrhages that are not readily controlled by other agents. Salts of iron with organic acids, as citric or acetic, are much less astringent and styptic. Commercial ferrous sulphate is often used for **disinfecting** sewage; probably it acts by coagulating albuminous matter. *Alimentary canal:* The astringent salts, as the sulphate or chloride, attack the enamel of the teeth and may cause a black coloration; consequently they should be given through a tube and the mouth subsequently rinsed. It is thought that in the stomach all salts of iron are converted into the chloride, the other acids being liberated and sometimes causing irritation. In the alkaline fluids of the intestine the iron salt probably changes to albuminates and perhaps hydroxides which are kept in solution. Small doses of iron generally increase the appetite and aid digestion, and are used as a general **tonic** in dyspepsia and convalescence from diseases. Larger doses generally cause constipation and the feces may be dark colored on account of the tannate and sulphide of iron formed. Large doses, or smaller doses given for some time, cause gastric irritation and indigestion, due largely to the free acid. Iron salts are used as astringents for diarrhea and dysentery, though other agents are often better. They are used as styptics in hemorrhages of the stomach and intestine, but have very little astringent or styptic effect if any after being absorbed. Much work has been done to determine whether iron is absorbed or not, but there is no doubt that its administration has a very beneficial effect in some diseases. *Circulation:* It is questionable whether the blood is materially changed in health by giving iron, but in chlorosis and other forms of anemia both the red corpuscles and the hemoglobin are increased. As a **blood tonic** it is used in anemia

due to various causes, in amenorrhea, cardiac diseases, syphilitic conditions, epilepsy, albuminuria, chronic affections of the respiratory organs. *Kidneys:* Iron may have a slight diuretic effect, but this is probably due to the systemic effect. The solution of ferric chloride is sometimes used by enema as an **anthelmintic** for thread-worms. The ferric hydroxide is one of the best **antidotes** for arsenic poisoning, being given freely and then removed by means of a cathartic. Iron is also considered an antidote in septic poisoning. Iron preparations should be given on a full stomach so as to avoid irritation, and the styptic taste can be almost removed by giving with glycerin.

Preparations and Doses.—Reduced iron, Iron sulphate dried; Iron and strychnine citrate, $\frac{1}{2}$ to 5 gr. (0.03 to 0.3 Gm.); Sulphate, Mass of carbonate, Lactate, Citrate, Iron and ammonium citrate, Iron and ammonium tartrate, Iron and potassium tartrate, Iron and quinine citrate, Soluble iron and quinine citrate, Soluble phosphate, Soluble pyrophosphate; Hypophosphite, 1 to 10 gr. (0.06 to 0.6 Gm.); Iron and ammonium sulphate; Saccharated carbonate, 2 to 15 gr. (0.12 to 1 Gm.); Solution of ferric chloride; Solution of ferric subsulphate, 1 to 5 ♏ (0.06 to 0.03 Cc.); Tincture of ferric chloride; Syrup of ferrous iodide, 5 to 30 ♏ (0.3 to 2 Cc.); Solution of iron and ammonium acetate; Compound mixture, 1 to 8 ℥ (4 to 30 Cc.); Wine and Bitter wine of iron, 1 to 4 ℥ (4 to 15 Cc.); Ferric hydroxide, 1 ℥ (4 Gm.), repeated; Ferric hydroxide with magnesium oxide, 4 ℥ (15 Gm.), repeated; Pills iodide of iron, Pills ferrous carbonate, Solution of ferric sulphate.

MANGANI DIOXIDUM PRÆCIPITATUM.

Synonyms.—Precipitated manganese dioxide, Black oxide of manganese. *Formula:* MnO_2.

Source.—From manganese sulphate by treating with an ammoniacal solution of hydrogen dioxide.

Description.—Heavy, fine, black powder; permanent; insoluble in water and alcohol; odorless; tasteless.

Action and Uses.—Not much used. Parasiticide in skin diseases; alterative in syphilis and scurvy; chiefly as an **emmenagogue** in amenorrhea.

Dose.—1 to 10 gr. (0.06 to 0.6 Gm.).

MANGANI HYPOPHOSPHIS.

Synonym.—Manganous hypophosphite. *Formula:* $Mn(PH_2O_2)_2 . H_2O$.

Source.—Obtained by mixing solutions of calcium hypophosphite and ferrous sulphate, filtering out the calcium sulphate and evaporating the solution.

Description.—Pink, crystalline powder; permanent; soluble in 6.6 parts of water, insoluble in alcohol; odorless; nearly tasteless.

Action and Uses.—Similar to calcium hypophosphite.

Dose.—1 to 10 gr. (0.06 to 0.6 Gm.).

MANGANI SULPHAS.

Synonym.—Manganous sulphate. *Formula:* $MnSO_4 . 4H_2O$.

Source.—From crude manganese dioxide by treating with sulphuric acid and purifying.

Description.—Colorless, or pale rose-colored, translucent prisms; slightly efflorescent; soluble in 0.7 part of water, insoluble in alcohol; odorless; bitter, astringent taste.

Action and Uses.—Rarely used now. Has been used as a **tonic,** like iron, in anemia; as a cholagogue in malarial jaundice.

Dose.—1 to 10 gr. (0.06 to 0.6 Gm.).

HYDRARGYRI CHLORIDUM CORROSIVUM.

Synonyms.—Corrosive mercuric chloride, Corrosive sublimate, Bichloride of mercury, Perchloride of mercury. *Formula:* $HgCl_2$.

Source.—From mercuric sulphate by subliming with sodium chloride.

Description.—Heavy, colorless, rhombic crystals, or crystalline masses; permanent; soluble in 13 parts of water and 3 of alcohol; odorless; acrid, metallic taste, but should be tasted with great caution. It is one of the few inorganic salts that are soluble in ether.

HYDRARGYRI CHLORIDUM MITE.

Synonyms.—Mild mercurous chloride, Mercurous chloride, Calomel, Protochloride of mercury, Calomelas, Mercurius dulcis. *Formula:* HgCl.

Source.—From mercuric sulphate by mixing thoroughly with metallic mercury and sodium chloride and subliming.

Description.—White, impalpable powder, becoming yellowish white on heavy trituration or long exposure to light; permanent in the air; insoluble in water or alcohol; odorless; tasteless.

HYDRARGYRI IODIDUM FLAVUM.

Synonyms.—Yellow iodide of mercury, Mercurous iodide, Protoiodide of mercury, Green iodide of mercury. *Formula:* HgI.

Source.—From metallic mercury by first forming the mercurous nitrate and then precipitating with potassium iodide.

Description.—Yellow, amorphous powder; quite quickly decomposed, forming metallic mercury and mercuric iodide and becoming green and then blackish on exposure to light; insoluble in water and alcohol; odorless; tasteless.

HYDRARGYRI IODIDUM RUBRUM.

Synonyms.—Mercuric iodide, Red iodide of mercury, Biniodide of mercury, Deutoiodide of mercury. *Formula:* HgI_2.

Source.—Obtained by mixing solutions of potassium iodide and mercuric chloride.

Description.—Scarlet, amorphous powder; permanent in the air, but turning brownish in the light; insoluble in water, soluble in 116 parts of alcohol; odorless; tasteless.

HYDRARGYRI OXIDUM FLAVUM.

Synonyms.—Yellow mercuric oxide, Precipitated oxide of mercury. *Formula:* HgO.

Source.—By precipitating a solution of mercuric chloride with a solution of sodium hydroxide.

Description.—Orange-yellow powder; permanent in the air, but turns darker in the light; insoluble in water and alcohol; odorless; metallic taste.

HYDRARGYRI OXIDUM RUBRUM.

Synonyms.—Red mercuric oxide, Red precipitate. *Formula:* HgO.

Source.—From mercuric nitrate by mixing with metallic mercury and heating.

Description.—Orange-red, crystalline scales or crystalline powder; more yellow the finer it is; permanent in the air, but becomes darker on exposure to light; insoluble in water and alcohol; odorless; metallic taste.

HYDRARGYRI SUBSULPHAS FLAVUS.*

Synonyms.—Yellow subsulphate of mercury, Basic mercuric sulphate, Turpeth mineral. *Formula:* $HgSO_4$. 2HgO, approximately.

Source.—From mercuric sulphate by treating with boiling water.

Description.—Bright lemon-yellow powder; permanent in the air; insoluble in water or alcohol; odorless; slight metallic taste.

HYDRARGYRUM AMMONIATUM.

Synonyms. — Ammoniated mercury, White precipitate, Mercuric ammonium chloride. *Formula:* NH_2HgCl.

Source.—From mercuric chloride by precipitating a solution of it with ammonia-water.

Description.—White, amorphous powder or irregular pieces; permanent; insoluble in water or alcohol; odorless; earthy, metallic taste.

HYDRARGYRUM.

Synonyms.—Mercury, Quicksilver. *Formula:* Hg.

Source.—Chiefly from the red sulphide of mercury by roasting.

Description.—Shining silver-white liquid; slightly volatile; sp. gr. 13.53; easily divided into globules; solidifies at 38.4° C.; odorless; tasteless; insoluble in water or alcohol.

Action and Uses of Mercury and its Salts.—Mercury and its salts vary in their local actions, but the systemic actions are similar. Large amounts of the insoluble salts have about the same effect as small doses of the soluble ones. Salivation is most likely to be produced by mass of mercury, next by calomel; inhalation of vapor is most likely to cause nervous symptoms and these are rarely produced except in chronic poisoning. Administration should be stopped short of salivation. Children are not easily salivated. Excessive doses cause symptoms resembling those of syphilis. After taking for some time, mercury can be found in almost every organ of the body. Eliminated by nearly all excretory organs, particularly the intestines and kidneys; eliminated slowly, has been found six months or longer after the last dose. Small doses increase hemoglobin and red corpuscles, but these are diminished by large doses.

Corrosive Chloride of Mercury. — *External:* Applied in strong solution it causes corrosion, necrosis, and sloughing. In dilute solution it destroys bacteria and their spores, prob-

ably by combining with albumin, and also by acting as a poison to them. A solution of 1 to 20,000 will kill many germs and 1 to 1000 will kill most spores; 1 to 2000 is often used for washing wounds. It is one of the most important antiseptics, but has the disadvantage that it is precipitated by albumin (prevented by alkali chlorides and citric and hydrochloric acids), is somewhat irritating, and may be absorbed. **Antiseptic** and **disinfectant,** used for disinfecting hands, or any part of the body, wounds of all kinds, stools, excreta, furniture, towels, bedding (not instruments, as they are attacked by it and mercury is deposited upon them); used in gonorrhea, leucorrhea, cholera. **Parasiticide** in dilute solution for lice, scabies, favus, ringworm, pityriasis, erysipelas, poison ivy eruption, and other skin diseases. *Internal:* Probably absorbed as the albuminate, which is soluble in excess of proteids and sodium chloride. It stimulates most glands. Used as a **tonic** in anemia. It is an **alterative** and **specific** in syphilis, but its exact action is unknown; particularly efficient for primary and secondary stages; difference of opinion as to its value in the third stage, but it is generally well given with potassium iodide; treatment must often be kept up for a year or longer. It is sometimes given by hypodermic injection; the patient comes under the influence of the drug more profoundly, digestion is not interfered with, the dose is better regulated, but it is painful and sometimes abscesses are formed. It is also used in chronic skin diseases.

Mild Chloride of Mercury.—*External:* By dusting on it is an **irritant** and **stimulant** for syphilitic ulcers. A weak ointment relieves pruritus, herpes zoster, eczema, seborrhea, conjunctivitis. Black wash has a similar effect, but weaker. *Alimentary canal:* Some experimenters say that it is converted into mercuric chloride, some say into the oxide, and others say a small amount is converted into the albuminate and absorbed as such. Some say it purges on account of its irritating properties and some that it increases secretions from glands, particularly the liver. It has long been taught that calomel either increases the secretion of bile from the liver or then aids its removal; some recent writers claim that it does neither, that the so-called "bilious condition" is not due to disordered

liver, but intestine; but the calomel acts on the intestine and that it is antiseptic, preventing the decomposition of bile by bacteria; hence the so-called bilious stools that follow the taking of calomel. Sodium bicarbonate is supposed to prevent the formation of mercuric chloride by neutralizing the gastric juice and to increase its action, but calomel is not changed to mercuric chloride by acids. Calomel is now generally given in small, repeated doses; it may cause some griping. It acts on the small intestine and its administration should be followed by a purgative which acts on the lower bowel, as black draught, or Seidlitz powder. Used as a **purgative cholagogue** and **intestinal antiseptic** in biliousness, torpid liver, gastro-intestinal catarrh, early stages of infectious diseases, dysentery, typhoid fever, Asiatic cholera, some forms of jaundice. Mercury with chalk has about the same action, but is milder, does not gripe; given to infants for diarrhea caused by undigested food, and to relieve vomiting just after taking food. *Kidneys:* Calomel probably directly irritates the epithelial cells; **diuretic**, particularly with squills and digitalis in case of cardiac dropsy, less reliable in other dropsies. By some writers it is claimed to have **antiphlogistic** properties and is used in various inflammations, particularly iritis, but some modern writers claim it has little or no effect as such. It has been used as a prophylactic for croup and diphtheria.

Oxides of Mercury.—The ointment of the yellow oxide is used for inflammation of the eyelids; to cure and prevent styes. The red oxide is sometimes dusted on to syphilitic ulcers and the ointment is used like the yellow oxide, but is more apt to produce irritation.

The Iodides.—The yellow iodide is one of the best mercurials for secondary syphilis. The red iodide is more irritating and poisonous; it is sometimes used as an antiseptic in eye surgery, as it is less irritating than the chloride.

Metallic Mercury.—Has but little local effect unless applied frequently to the same place. Given by inunction, fumigation, inhalation, or by mouth, it has its systemic effect and is used for syphilis or as a purgative. It may be oxidized in the body, causing poisoning. Colloidal mercury is said to have the

advantages that it is readily absorbed, non-irritating, and has an enduring effect as an antisyphilitic.

Other Preparations.—Ammoniated mercury is used in the form of ointment as a parasiticide for lice and some chronic skin diseases. The subsulphate is usually a prompt and harmless emetic. The nitrate is a strong caustic and the ointment of the nitrate is used for warts, chancroids, syphilitic nodes, eczema, psoriasis, and other skin diseases; causes considerable pain and should generally be diluted. The oleate is used as a parasiticide like citrine ointment; also as a sorbefacient in inflammatory diseases, enlarged joints and glands, chronic peritonitis, orchitis. Colloidal mercury is used some to produce the general effects.

Toxicology.—Chronic poisoning, mercurialism, ptyalism: May be caused by prolonged taking of mercury in any form. Persons vary greatly in their susceptibility. Formerly physicians pushed mercury to salivation, but now they try to avoid it. Among the first symptoms are metallic taste, soreness and numbness of tongue and gums, fetid breath, followed by swollen tongue, gums soft and dark, bluish-red or gray, saliva greatly increased and changed; further administration causes ulcers in the mouth, teeth become loose, gangrene of gums and throat, necrosis of jaw. Often there is a loss of appetite, colic, diarrhea, increased and then diminished urine, occasionally a skin eruption, rarely nervous symptoms, as tremor, shooting pains, neuralgia, insomnia, paresis. In treating, aid elimination by hot baths, diuretic drinks, large amounts of water; give purgatives or astringents as required, opium for pain, belladonna for excessive saliva; potassium iodide aids its removal from combination with tissues, but should be given carefully in order not to get too much liberated at once; attention to hygiene and clean mouth will do much as a preventive.

Acute Poisoning.—Corrosive sublimate is the salt usually taken. Minimum fatal dose is about 3 grains for an adult. When swallowed the symptoms are metallic taste at once, burning in throat and stomach, nausea, vomiting, the vomit often containing shredded mucous membrane and blood; diarrhea, tenesmus, bloody stools, swollen and tender abdo-

men; thready, irregular pulse; irregular and difficult breathing; cold, clammy skin; pinched features, subnormal temperature, diminished urine containing blood and albumin; consciousness is not affected for some time. The patient may die within a half-hour from shock or may live several days or a week and die from exhaustion caused by the corrosion. In treating, empty the stomach with a tube preferably, or give an emetic, as apomorphine hydrochloride, egg albumen (three eggs to about 4 gr. of the sublimate), milk, wheat flour or some albuminous substance, tannic acid, stimulants if necessary.

Preparations and Doses.—Mercuric chloride, $\frac{1}{100}$ gr. (0.0006 Gm.) as a tonic; $\frac{1}{50}$ to $\frac{1}{8}$ gr. (0.0012 to 0.008 Gm.) as an antisyphilitic. Mercuric iodide, $\frac{1}{50}$ to $\frac{1}{8}$ gr. (0.0012 to 0.008 Gm.). Mercurous chloride, $\frac{1}{10}$ to 5 gr. (0.006 to 0.3 Gm.) or more. Mercurous iodide, $\frac{1}{10}$ to 1 gr. (0.006 to 0.06 Gm.). Mercury with chalk, Mass of mercury, 1 to 10 gr. (0.06 to 0.6 Gm.). Mercuric subsulphate, 2 to 4 gr. (0.12 to 0.25 Gm.) as an emetic. Yellow oxide, Red oxide, Ammoniated mercury, Ointment, Diluted ointment, Plaster.

AURI ET SODII CHLORIDUM.

Synonym.—Gold and sodium chloride. *Formula:* Mixture of gold chloride ($AuCl_3$) and sodium chloride (NaCl).

Source.—Dissolving equal weights of sodium chloride and gold chloride in water and evaporating.

Description.—Orange-yellow powder; deliquescent; soluble in water, partly soluble in alcohol; odorless; saline, metallic taste.

Action and Uses.—Action is analagous to **mercury**. Supposed to increase the appetite and aid digestion; used in irritative dyspepsia, gastro-intestinal catarrh. Claimed by some to be better **alterative** in tertiary syphilis than mercury. Said to be one of the agents given in the "Keely Cure" institutes for the alcohol habit, but this is doubtful. Diuretic, aphrodisiac, diaphoretic, emmenagogue.

Dose.—$\frac{1}{30}$ to $\frac{1}{5}$ gr. (0.002 to 0.012 Gm.).

PLUMBI ACETAS.

Synonyms.—Lead acetate, Sugar of lead. *Formula:* $Pb(C_2H_3O_2)_2 . 3H_2O$.

Source.—From metallic lead by dissolving in acetic acid.

Description.—Colorless, shining, transparent prisms or plates, or heavy, white, crystalline masses, or granular crystals; gives off acetic acid and water of crystallization and absorbs carbon dioxide on exposure; soluble in 2 parts of water and 30 of alcohol; faint, acetous odor; sweet, astringent taste.

PLUMBI IODIDUM.

Synonym.—Lead iodide. *Formula:* PbI_2.

Source.—From lead nitrate by precipitating a solution with potassium iodide.

Description.—Bright-yellow, heavy powder; permanent; soluble in about 1300 parts of water and sparingly in alcohol; odorless; tasteless.

PLUMBI NITRAS.

Synonym.—Lead nitrate. *Formula:* $Pb(NO_3)_2$.

Source.—From lead by dissolving in nitric acid.

Description.—Colorless, transparent, octahedral crystals, or white, opaque crystals; permanent; soluble in 1.85 parts of water, insoluble in alcohol; odorless; sweet, astringent, metallic taste.

PLUMBI OXIDUM.

Synonyms.—Lead oxide, litharge. *Formula:* PbO.

Source.—From lead by heating in air.

Description.—Yellowish or reddish-yellow, heavy powder or minute scales; slowly absorbs moisture and carbon dioxide on exposure; nearly insoluble in water, insoluble in alcohol; odorless; tasteless.

PLUMBI CARBONAS.*

Synonyms.—Lead carbonate, Basic lead carbonate, White lead, Flake white. *Formula:* $2PbCO_3$. $Pb(OH)_2$, approximately.

Source.—From lead by the action of acetic acid and carbon dioxide.

Description.—Heavy, white, amorphous powder or pulverulent masses; permanent; insoluble in water or alcohol; odorless; tasteless.

PLUMBI OXIDUM RUBRUM.*

Synonyms.—Red oxide of lead, Red lead, Minium. *Formula:* Pb_3O_4.

Source.—From lead oxide by heating.

Description.—Bright-red, granular, somewhat crystalline powder; permanent; insoluble in water or alcohol; odorless; tasteless.

Action and Uses of Lead Salts.—All salts have about the same action, varying in degree. While they are of some therapeutic importance, they are of more interest on account of the frequent cases of chronic poisoning. The effects of large doses will be discussed under Toxicology. *External:* Little or no effect on unbroken skin. On the broken skin salts of lead coagulate albumin in tissues and discharges, lessen secretion, contract muscular tissues and smaller bloodvessels, and depress the endings of the sensory nerves. In strong solutions they act as irritants and mild caustics. Dilute solutions of lead acetate or subacetate are used as **astringents, sedatives,** and **protectives** in bruises, sprains, inflammations of different kinds, itching, vulvitis, erysipelas, skin diseases, hemorrhoids, poisoning from poison ivy, catarrhal discharges from mucous membranes, as gonorrhea, leucorrhea, otorrhea. Lead-water and laudanum is a favorite prescription, though of doubtful usefulness, as the alkaloids and lead are largely precipitated. Solutions of lead acetate and zinc sulphate are sometimes

mixed and it is claimed that the resulting lead sulphate is slightly astringent. Lead carbonate with olive oil is used in erysipelas, bruises, and burns where the surface is unbroken; the carbonate is dusted on or diachylon ointment applied in eczema, herpes, dermatitis, seborrhea. Lead plaster is good to prevent bed-sores. Lead iodide is used as a resolvent for enlarged glands, eczema, synovitis, and as a **stimulant** to indolent ulcers. Lead nitrate in dilute solution is used for fissured nipples, chapped hands and lips, deodorant for gangrenous sores and discharges. Lead oxide is not much used, except for making lead plaster; sometimes with olive oil for superficial burns. *Alimentary canal:* The acetate is about the only salt used internally. In large doses it is **emetic.** In small doses it is used alone or with opium as an **astringent** and to allay inflammation in gastralgia, chronic gastric catarrh, diarrhea, dysentery, bronchitis; as a **hemostatic** in hemorrhage from the stomach and intestines, as in case of cancer, typhoid fever, or tuberculosis; used as an **anhydrotic** to check the night-sweats of phthisis; should not be given over too long a period, as it may cause chronic poisoning. Not used much now in epilepsy, chorea, hysteria, whooping-cough, aneurysms, and other diseases for which it was formerly highly valued. *Absorption and elimination:* A small amount is absorbed as the albuminate more quickly than most metals; slowly eliminated, consequently it is cumulative; most of it is eliminated in the feces, which may be black from the sulphide formed, but some is found in the urine, bile, saliva, milk, and sweat.

Toxicology.—Acute poisoning is comparatively rare, as a large amount is required and vomiting generally results. The symptoms are those of irritants—nausea, vomiting of white matter containing lead chloride, pain in the abdomen, purging or constipation, great thirst, weakness, and collapse. In treating, wash out the stomach or give emetics if necessary, sodium or magnesium sulphate, white of egg, purgatives if constipated, stimulants, external warmth. **Chronic poisoning** is common and is accidental. Painters, plumbers, smelters, gold-miners, type-setters, potters, and glaziers are most liable; other sources of poisoning are water or liquids that have stood in lead pipes, lead used in closing cans of food,

hair dyes, face powders, lead toys for children, lead bullets, biting leaded-white thread. Symptoms vary; sometimes only one or two organs affected and sometimes the whole body. Loss of appetite, nausea, constipation, metallic taste, fetid breath, blue line in gums at the margin of the teeth which is due to lead sulphide, emaciation, slow heart, anemia largely due to destruction of the red blood corpuscles, increased number of white corpuscles, often jaundice, sometimes abortion. Lead colic or painters' colic sets in suddenly; for several days there may be paroxysms alternating with freedom from pain; then it disappears, but may return; due to nerve affection. Paralysis, painters' palsy, or wrist-drop is generally limited to the extensor muscles of the forearm; both arms may be affected, but usually only one; probably due to peripheral neuritis. Sharp, lancinating, boring pains in the joints and muscles come suddenly and disappear as quickly. Sometimes gout, nephritis, dropsy, uremia, local anesthesia, blindness, delirium, convulsions. Death usually results from malnutrition. Anemia and weakness predispose. In treating, the patient should be removed from contamination. Give cathartics, potassium iodide to favor elimination, diuretics and hot baths, strengthening diet, morphine to relieve pain, strychnine for paralysis. Frequent bathing and thorough ventilation of the room tend to prevent poisoning.

Preparations and Doses.—Acetate, Iodide, $\frac{1}{2}$ to 3 gr. (0.03 to 0.18 Gm.). Nitrate, Oxide, Red oxide, Carbonate, Solution of subacetate, Dilute solution of subacetate, Cerate of subacetate, Plaster, Adhesive plaster, Diachylon ointment.

ZINCI ACETAS.

Synonym.—Zinc acetate. *Formula:* $Zn(C_2H_3O_2)_2.2H_2O$.

Source.—From zinc oxide or carbonate by dissolving in acetic acid, filtering, and crystallizing.

Description.—Soft, white, six-sided plates; pearly lustre; effloresce and lose some acetic acid on exposure; soluble in 2.5 parts of water and 36 of alcohol; slight acetous odor; astringent, metallic taste.

ZINCI BROMIDUM.

Synonym.—Zinc bromide. *Formula:* $ZnBr_2$.

Source.—From granulated zinc by dissolving in hydrobromic acid.

Description.—White, granular powder; very deliquescent; soluble in water and alcohol; odorless; sharp, saline, metallic taste.

ZINCI CARBONAS PRÆCIPITATUS.

Synonyms.—Zinc carbonate, Precipitated zinc carbonate, Calamine (impure salt). *Formula:* Variable, approximately $2ZnCO_3$. $3Zn(OH)_2$.

Source.—From zinc sulphate by adding a solution of it to a solution of sodium carbonate, boiling, and washing by decantation.

Description.—White, impalpable powder; permanent; insoluble in water or alcohol; odorless; tasteless.

ZINCI CHLORIDUM.

Synonyms.—Zinc chloride, Butter of Zinc. *Formula:* $ZnCl_2$.

Source.—From granulated zinc by dissolving in hydrochloric acid.

Description.—White, granular powder; irregular, porcelain-like masses or pencils; very deliquescent; very soluble in water and alcohol; odorless; very caustic taste; when diluted it has an astringent, metallic taste.

ZINCI IODIDUM.

Synonym.—Zinc iodide. *Formula:* ZnI_2.

Source.—From zinc oxide or carbonate by dissolving in hydriodic acid.

Description.—White, granular powder; very deliquescent, becoming brown from liberated iodine on exposure; readily soluble in water and alcohol; odorless; sharp, saline, metallic taste.

ZINCI OXIDUM.

Synonyms.—Zinc oxide, Flowers of zinc, Zinc white. *Formula:* ZnO.

Source.—From zinc carbonate by heating.

Description.—White or yellowish-white, amorphous, impalpable powder; slowly absorbs carbon dioxide from air; insoluble in water or alcohol; odorless; tasteless.

ZINCI PHENOLSULPHONAS.

Synonyms.—Zinc phenolsulphonate, Zinc sulphocarbolate. *Formula:* $Zn(C_6H_5O_4S)_2 . 8H_2O$.

Source.—From barium phenolsulphonate by adding a solution of it to a solution of zinc sulphate, the barium sulphate being precipitated and filtered out, the filtrate concentrated and crystallized.

Description. — Colorless, transparent prisms or tabular crystals; efflorescent, becoming pinkish in light; soluble in 1.7 parts of water or alcohol; odorless; astringent, metallic taste.

ZINCI STEARAS.

Synonym. — Zinc stearate. *Formula:* $Zn(C_{18}H_{35}O_2)_2$, approximately.

Source.—Mixing solutions of zinc acetate and sodium stearate.

Description.—Fine, white powder; permanent; insoluble in water or alcohol; slight odor of fat; tasteless.

ZINCI SULPHAS.

Synonyms. — Zinc sulphate, White vitriol. *Formula:* $ZnSO_4 . 7H_2O$.

Source.—From granulated zinc by dissolving in dilute sulphuric acid.

Description.—Colorless, transparent crystals or granular, crystalline powder; efflorescent; soluble in 0.53 part of water, insoluble in alcohol; odorless; astringent, metallic taste.

ZINCI VALERAS.

Synonyms.—Zinc valerate, Zinc valerianate. *Formula:* $Zn(C_5H_9O_2)_2 . 2H_2O$.

Source.—Mixing hot solutions of zinc sulphate and sodium valerate, concentrating and removing the crystals.

Description.—White, pearly scales, slowly losing valeric acid on exposure; soluble in about 50 parts of water and 35 of alcohol; odor of valeric acid; sweetish, astringent, metallic taste.

ZINCUM.

Synonym.—Zinc. *Formula:* Zn.

Source.—From lead ores and from calamine by heating with charcoal.

Description.—Bluish-white metal with crystalline fracture; sometimes in sheets, irregular granules, thin pencils, or powder; permanent; insoluble in water or alcohol; odorless; tasteless.

Action and Uses of Zinc Salts.—Resemble copper salts. *External:* All are more or less **astringent** and **hemostatic,** precipitating albumin. The oxide and carbonate may be dusted on or applied as an ointment as a protective and astringent in superficial burns, abraded surfaces, ulcers, fissures, and to allay itching and chafing. The stearate and phenolsulphonate are used as antiseptics and astringents for eczema, acne, and

other skin diseases. Dilute solutions (1 to 3 gr. of the salt to 1 oz. of water) of the acetate, chloride, iodide, or sulphate are used as astringents and stimulating irritants for conjunctivitis, tonsillitis, vaginitis, gonorrhea, abscesses, skin diseases, pruritus. In stronger solution the chloride is **antiseptic** and **disinfectant,** is an ingredient in several widely advertised disinfectant preparations; used to disinfect old sores, wounds, urinals, feces, and as an embalming fluid. Applied to tissue as a paste or pencil zinc chloride is an **escharotic,** burning deeply with much pain, but not spreading much; used on warts, condylomas, gangrenous sores, inoperable or cutaneous cancer; not used now as much as it was before surgery reached its present stage; not used internally. *Alimentary canal:* Small doses of soluble salts and larger doses of the insoluble ones are astringents; used in chronic diarrhea, dysentery, summer diarrhea of infants, gastric catarrh of drunkards, and gastralgia. Zinc sulphate is a very prompt **emetic,** probably acting by its irritating effect, acts so quickly that there is but little nausea or depression; used to produce vomiting in case of croup, narcotic or other poisoning. It was formerly thought that zinc salts were **antispasmodics** and were used for epilepsy, whooping-cough, spasmodic asthma, hysteria, but are seldom used as such now. The oxide has been given in the night-sweats of phthisis. The valerate is used chiefly in nervous troubles; zinc bromide is used similarly to potassium bromide; zinc iodide is supposed to combine the specific properties of an iodide with the astringent properties of zinc.

Preparations and Doses.—Acetate, Bromide, Iodide, 1 to 3 gr. (0.06 to 0.18 Gm.). Oxide, 1 to 10 gr. (0.06 to 0.6 Gm.). Phenolsulphonate, 1 to 5 gr. (0.06 to 0.3 Gm.). Sulphate, as an emetic, 10 to 30 gr. (0.6 to 2 Gm.); as an astringent and tonic, $\frac{1}{2}$ to 2 gr. (0.03 to 0.12 Gm.). Phosphide,* $\frac{1}{20}$ to $\frac{1}{10}$ gr. (0.003 to 0.006 Gm.).

CUPRI SULPHAS.

Synonyms.—Copper sulphate, Blue vitriol, Blue stone. *Formula:* $CuSO_4 . 5H_2O$.

Source.—From copper sulphide by oxidation.

Description.—Large, transparent, blue crystals; slowly efflorescent; soluble in 2.2 parts of water and 400 of alcohol; odorless; nauseous, metallic taste.

Action and Uses.—External: Action similar to lead, more astringent than zinc sulphate, less corrosive and painful than silver nitrate or mercuric chloride. Dilute solutions are used as **astringents**; used as a **parasiticide** in scabies, acne, psoriasis, ringworm, and other skin diseases. Applied in solid form as a mild **caustic** and **astringent** for indolent ulcers and granulations, on granular eyelids and small wounds. *Alimentary canal:* Small doses are astringent, used in acute and chronic diarrhea and dysentery; often combined with opium. Has been used in anemia, chlorosis, syphilis, epilepsy, chorea, but the internal use is largely abandoned. Moderate doses cause prompt emesis with but little depression, acting by irritation of the mucous membrane; more irritating than zinc sulphate. Used as an **emetic** in croup and poisoning by narcotics, but in case it fails it should be removed by other means to avoid ill effects from it; has been highly recommended in phosphorus poisoning on account of supposed formation of the insoluble copper phosphide, but it is doubtful if it is of service. Copper sulphate has recently been used for **purifying water.** One part in 50,000,000 parts of water destroys most algæ that polute water. One part to 100,000 parts of water destroys cholera and typhoid-fever germs in a few hours. No ill effects have been reported in taking copper in larger amounts than would be taken in drinking this water.

Toxicology.—In acute poisoning there is a metallic, astringent taste, nausea, salivation, vomiting and purging; the vomit and stools may be blue or green from the copper, but later contain blood. Violent abdominal pain, weak pulse; cold, clammy skin; delirium, coma, death. Patient may die in a few hours or may live several days and then die from exhaustion. Post-mortem examination shows fatty degeneration of liver and kidneys. In treating, give albumin, milk, or magnesia; empty the stomach; give demulcents, potassium iodide to aid elimination; stimulants, as strychnine; heat. Chronic poisoning sometimes occurs from the use of copper cooking utensils or eating canned vegetables colored with copper. On the other

hand copper in different forms has been given in small and large doses over long periods of time without producing symptoms of poisoning. A small percentage of persons working with copper are poisoned.

Perhaps the symptoms are due to other agents associated with copper, as lead and arsenic. Copper is found so often in the healthy body that it is considered a normal constituent of the body by some.

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ gr. (0.008 to 0.03 Gm.) as an astringent; 2 to 10 gr. (0.12 to 0.6 Gm.) as an emetic, to be repeated in fifteen minutes if necessary.

CUPRI ACETO-ARSENIS.*

Synonyms.—Aceto-arsenite of copper, Paris or Schweinfurt green. *Formula:* $Cu(C_2H_3O_2)$. $3Cu(AsO_2)_2$, approximately.

Source.—Boiling together solutions of copper acetate and arsenous acid.

Description.—Heavy, green powder; insoluble in water or alcohol; odorless; very poisonous.

Uses.—As an insecticide, formerly as a pigment.

ARGENTI NITRAS.

Synonyms. — Silver nitrate, Lunar caustic. *Formula:* $AgNO_3$.

Source.—From metallic silver by dissolving in nitric acid.

Description.—Colorless, transparent, tabular crystals, becoming gray or grayish black on exposure; soluble in 0.54 part of water and 24 of alcohol; odorless; bitter, caustic, metallic taste.

Argenti Nitras Fusus.—Fused or Molded silver nitrate or Toughened caustic is made by adding a little hydrochloric acid to silver nitrate, fusing and molding; the silver chloride formed makes it less brittle. Occurs in white, hard pencils or cones and contains about 5 per cent. silver chloride.

ARGENTI NITRAS MITIGATUS.—Mitigated or Diluted silver nitrate, or Mitigated caustic is made by fusing silver nitrate with twice its weight of potassium nitrate. Occurs in white, hard pencils or cones.

ARGENTI OXIDUM.

Synonym.—Silver oxide. *Formula:* Ag_2O.

Source.—From silver nitrate by precipitating with an alkali hydroxide.

Description.—Dark, brownish-black, heavy powder, slowly reduced to the metal on exposure; nearly insoluble in water, insoluble in alcohol; odorless; metallic taste. Should not be triturated with organic matter or reducing agents, as explosion may result.

Action and Uses of Silver Salts.—Silver nitrate is the salt generally used and the one described here. *External:* It is similar to lead acetate, but more irritating and corrosive, though not so much so as mercuric chloride. Silver nitrate in any form coagulates albumin. Dilute solutions contract bloodvessels and stronger solutions dilate vessels on account of the irritation. Solutions varying in strength from 0.25 to 5 per cent. are used as **astringents** and stimulating **irritants** for granular eyelids, chronic pharyngitis, purulent conjunctivitis, lichen, herpes, eczema, and other skin diseases; pruritus, vaginitis, gonorrhea, leucorrhea; to prevent bed-sores, abort boils and styes. **Antiseptic,** coagulating the albuminous matter of the bacteria and the albuminous surface upon which they may be growing, as well as being a poison to them. Applied in solid form, it causes a white eschar which turns dark on account of the reduction of the silver; does not penetrate deep because the coagulated albumin acts as a barrier. It is a good **caustic** for warts, ulcers, granular lids, venereal sores, chancroids; used on smallpox vesicles to prevent pitting; not good for deep-poisoned wounds, as snake-bites, because the film keeps in the poison; used to cauterize tissue around erysipelas to limit it. It is **hemostatic** for leech-bites and small hemorrhages. *Internal:* The action is not well understood.

In the alimentary canal it is changed to chloride and albuminate and soon reduced to the metal. Probably has an astringent action; used in gastritis, gastric ulcer, persistent vomiting, some forms of diarrhea and dysentery; often combined with opium or other drugs which may be more beneficial than the silver. In large amounts it is a gastro-intestinal irritant. Probably only a very small amount is absorbed, and that remains a long time in the tissues. Taken for a long time it discolors the skin (argyria), giving a light to a dark-gray color. It has been used to a considerable extent in epilepsy and other nervous diseases, but with little benefit. The oxide is less irritating than the nitrate.

Some non-official compounds, such as Argentamin (silver phosphate in solution), Argonin (silver caseinate), Itrol (silver citrate), and Protargol (protein-silver compound) are generally claimed to be more astringent and antiseptic but less irritating than the nitrate. Colloidal silver has been injected hypodermically for sepsis.

Preparation and Doses.—Nitrate, $\frac{1}{8}$ to $\frac{1}{2}$ gr. (0.006 to 0.03 Gm.). Oxide, $\frac{1}{2}$ to 2 gr. (0.03 to 0.12 Gm.).

BISMUTHI CITRAS.

Synonym.—Bismuth citrate. *Formula:* $BiC_6H_5O_7$.

Source.—From bismuth subnitrate by boiling with a solution of citric acid.

Description.—White, amorphous or microcrystalline powder; permanent; insoluble in water or alcohol; odorless; tasteless.

BISMUTHI ET AMMONII CITRAS.

Synonym.—Bismuth and ammonium citrate. *Formula:* None can be given.

Source.—Dissolving bismuth citrate in ammonia water, evaporating, and scaling.

Description.—Shining, pearly or translucent scales, losing ammonia and becoming opaque on exposure; soluble in water, sparingly soluble in alcohol; odorless; metallic taste

BISMUTHI SUBCARBONAS.

Synonyms.—Bismuth subcarbonate, Bismuth carbonate, Pearl white. *Formula:* $(BiO)_2CO_3$. H_2O, approximately.

Source.—Made by mixing solutions of bismuth nitrate and ammonium carbonate.

Description.—White or yellowish-white powder; permanent; insoluble in water or alcohol; odorless; tasteless.

BISMUTHI SUBGALLAS.

Synonyms.—Bismuth subgallate, Bismuth gallate, Dermatol. *Formula:* $Bi(OH)_2C_7H_5O_5$, approximately.

Source.—From an acetic acid solution of bismuth subnitrate by adding a solution of gallic acid.

Description.—Amorphous, bright-yellow powder; permanent; insoluble in water or alcohol; odorless; tasteless.

BISMUTHI SUBNITRAS.

Synonyms.—Bismuth subnitrate, Bismuth oxynitrate, White bismuth. *Formula:* $BiONO_3$. H_2O, approximately.

Source.—From metallic bismuth by dissolving in nitric acid and pouring into water.

Description.—Heavy, white powder; permanent; insoluble in water or alcohol; odorless; tasteless.

BISMUTHI SUBSALICYLAS.

Synonyms.—Bismuth subsalicylate, Bismuth oxysalicylate, Bismuth salicylate. *Formula:* $BiOC_7H_5O_3$, approximately.

Source.—From an acetic acid solution of bismuth subnitrate by precipitating the hydroxide with ammonia and digesting it with salicylic acid.

Description.—White or nearly white, amorphous or crystalline powder; permanent; nearly insoluble in water, insoluble in alcohol; odorless; tasteless.

Action and Uses of Bismuth Salts.—Bismuth subnitrate is most commonly used. *External:* The subnitrate or subgallate when dusted on is **astringent**, drying up the moist surface and acting as a protective; used for ulcers, abraded surfaces, eczema, chafing, sore nipples, fissures; snuffed up the nose for coryza and ozena. The subnitrate is used some in surgery, acting more as an absorbent than an antiseptic. *Alimentary canal:* The insoluble salts are astringent, **sedative** to the end organs of the nerves, and act mechanically as protectives to inflamed membranes; used in gastric pain, gastric ulcer, vomiting from any cause, acute and chronic gastritis, diarrhea, dysentery, cholera infantum, and catarrh. In medicinal doses very little bismuth is absorbed, most being eliminated in the feces as the black sulphide or a reduced form of bismuth. It seems to be more readily absorbed from raw surfaces than from mucous membranes, and several cases of poisoning from local application have been reported. Insoluble salts give better results than soluble ones; the bismuth and ammonium citrate, being irritating, is not much used. The uses of the subcarbonate are the same as those of the subnitrate. Poisoning from the internal administration of bismuth subnitrate has been reported, but these cases are probably due to the bismuth salt having impurities, as arsenic or lead.

Several non-official compounds are used some; the oxyiodogallate (Airol), tribromophenolate (Xeroform), naphtholate (Orphol), dithiosalicylate (Thioform) are said to be more antiseptic and are used as substitutes for iodoform.

Preparations and Doses.—Citrate; Bismuth and ammonium citrate, 1 to 5 gr. (0.06 to 0.3 Gm.); Subnitrate, Subcarbonate, Subgallate, Subsalicylate, Orphol; Xeroform, 5 to 20 gr. (0.3 to 1.3 Gm.).

ALUMEN.

Synonyms.—Alum, Potassium alum, Aluminum and potassium sulphate. *Formula:* $KAl(SO_4)_2.\ 12H_2O$.

Source.—From various combinations of aluminum that are found in the earth.

Description.—Large, colorless, octahedral crystals, sometimes cubical or crystalline fragments; slightly efflorescent; soluble in 9 parts of water, insoluble in alcohol; odorless; sweet, astringent taste. Ammonium alum is very similar in properties to potassium alum and is frequently used in commerce.

ALUMEN EXSICCATUM.

Synonyms.—Dried alum, Burnt alum, Alumen ustum. *Formula:* $KAL(SO_4)_2$.

Source.—From alum by heating.

Description.—White, granular powder; absorbs moisture on exposure; soluble in about 17 parts of water, insoluble in alcohol; odorless; sweet, astringent taste.

ALUMINI HYDROXIDUM.

Synonyms.—Aluminum hydroxide, Hydrated alumina. *Formula:* $Al(OH)_3$.

Source.—From alum by precipitating a hot solution with a hot solution of sodium carbonate.

Description.—White, light powder; amorphous; permanent; insoluble in water or alcohol; odorless; tasteless.

ALUMINI SULPHAS.

Synonym.—Aluminum sulphate. *Formula:* $Al_2(SO_4)_3$. $16H_2O$.

Source.—From aluminum hydroxide by dissolving in sulphuric acid.

Description.—White, crystalline powder or crystalline plates, or fragments; permanent; soluble in 1 part of water, insoluble in alcohol; odorless; sweet, astringent taste.

Action and Uses of Aluminum Salts.—Alum is the most commonly used salt. *External:* Alum coagulates albumin

when applied to raw surfaces or mucous membranes, contracting the tissues and bloodvessels, diminishing secretions. In solution it is used as an **astringent** for sore throat, tonsillitis, stomatitis, weeping eczema, excessive sweating of the hands and feet, sore nipples, bed-sores, pruritus, cystitis, gonorrhea. In strong solution or in solid form it is a local **hemostatic**; used in capillary hemorrhage, leech-bites, tooth extraction, epistaxis, bleeding piles. Dried alum is an **escharotic**, used for unhealthy granulations, warts, indolent ulcers. Aluminum sulphate is not much used, but is similar to alum. The hydroxide is absorbent and astringent. While all salts are somewhat **antiseptic**, the acetate and chloride are particularly so. *Alimentary canal:* Alum first increases saliva and then decreases it, coagulates pepsin, stops peristalsis; astringent in small doses, but not as effective as some others; used in catarrh of the stomach, gastralgia, diarrhea, dysentery, typhoid fever, intestinal hemorrhage, lead colic. In large doses it is **emetic**, acting by irritating the membrane; used for croup and bronchitis of children; too slow for cases of poisoning. It is absorbed to only a very slight extent.

Doses.—Alum, 5 to 15 gr. (0.3 to 1 Gm.) as astringent; 1 to 2 ʒ (4 to 8 Gm.) as emetic. Aluminum hydroxide, 3 to 20 gr. (0.18 to 1.3 Gm.).

KAOLINUM.

Synonyms.—Kaolin, Fuller's earth, Porcelain clay. *Formula:* It is an impure native aluminum silicate.

Source.—Occurs in the earth.

Description.—Soft, white or yellowish-white powder, or in lumps; permanent; insoluble in water or alcohol; odorless; tasteless.

Action and Uses.—Occasionally used as an **emollient** and absorbing powder for inflamed surfaces. In the cataplasm it is used as the vehicle for glycerin. Used in pharmacy as a clarifying agent, and as a base for pills containing strong oxidizing agents.

Preparation.—Cataplasm of kaolin.

ARSENI IODIDUM.

Synonym.—Arsenous iodide. *Formula:* AsI_3.

Source.—Heating together metallic arsenic and iodine.

Description.—Orange-red, crystalline powder, decomposed by light; soluble, with partial decomposition, in about 12 parts of water and 28 parts of alcohol; iodine-like odor and taste.

ARSENI TRIOXIDUM.

Synonyms.—Arsenic trioxide, Arsenous acid, Arsenous anhydride, White arsenic, Arsenic. *Formula:* As_2O_3.

Source.—Largely as a biproduct in roasting cobalt, nickel, tin, and iron ores.

Description.—Irregular masses, either amorphous, transparent, glass-like or crystalline, opaque and porcelain-like, or it may be in a white, opaque powder; sometimes pieces have opaque layer outside the glossy kind; slowly soluble in water, the glassy requiring about 30 parts and the opaque requiring about 100 parts; sparingly soluble in alcohol; odorless; tasteless.

Action and Uses.—In concentrated form arsenic trioxide has but little effect on unbroken skin unless repeatedly applied; applied to a denuded surface or mucous membrane it is a slow, painful **escharotic,** burning deeply, not combining with the tissue; used as a paste to remove warts, growths of various kinds, lupus, cancer (base of several secret cancer cures); must be strong enough to cause sloughing off of dead tissue before the arsenic is absorbed. Also used to kill the nerves in teeth. Used in the form of an ointment as a stimulating irritant for chronic eczema and skin diseases. In sufficiently strong solutions it preserves animal tissue, but cannot be used as a general **antiseptic**; frequently used in embalming fluids; said to be one-tenth as strong an antiseptic as corrosive sublimate; arsenates are much less antiseptic. *Alimentary canal:* Small doses stimulate the flow of gastric and intestinal secretions, increase appetite, digestion, and peristalsis. Large

doses cause gastro-intestinal irritation, nausea, vomiting, fatty degeneration of the mucous membrane, but not corrosion like other poisons (the action in this respect is not well known). Best given after a meal so as to avoid its irritating effects. Children bear it well. Used as a **tonic** in irritative and atonic dyspepsia, gastralgia. **Alterative** in chronic rheumatism, cirrhosis of the liver, sarcoma, syphilis; dry, scaly skin diseases, as psoriasis, lepra, lichen, but not in their acute and moist form; taken by young women to produce a clear complexion. Used as a **sedative** to relieve vomiting from regurgitation of food, from cancer of the stomach, from pregnancy. **Astringent** in some forms of diarrhea, as when caused by undigested food or a malarial condition; sometimes used in cholera. *Nervous system:* Slight stimulant. Said to be almost a **specific** for chorea; used for whooping-cough, hay fever, neuralgia, melancholia, angina pectoris, and asthma (often an ingredient in asthma cigarettes). *Circulation:* Small doses slightly stimulate and large doses depress the heart. Vessels of the stomach and bowels are dilated and the capillaries seem to be rendered more permeable by fluids. Small doses probably slightly increase the number of red blood corpuscles. Used for anemia, particularly the pernicious type; also leukemia, chlorosis; seems to increase the efficiency of iron when given with it. Used in some heart diseases. *Respiration:* Temporarily stimulated; used in commencement of phthisis and catarrhal pneumonia and in chronic bronchitis. It is an **antiperiodic** and specific for chronic malaria, but inferior to quinine; used as a prophylactic for diseases of a malarial origin, intermittent fever. **Emmenagogue** for amenorrhea, dysmenorrhea; aphrodisiac. *Toleration:* Generally easily established by commencing with small doses and gradually increasing, but should any signs of chronic poisoning appear the dose should be reduced. Peasants of Styria and Tyrol get so that they take several grains at a time and they seem healthy and are long-lived. On the other hand some persons working with arsenical ore are short-lived, subject to rickets, dropsies, and respiratory diseases. *Metabolism:* Its action on nutrition has not been satisfactorily explained. Small doses reduce oxidation, while large ones increase elimination of

nitrogenous matter and cause fatty degeneration of liver, kidneys, heart, and vessels. *Absorption and elimination:* After a course of treatment arsenic is found in nearly all organs, particularly the liver. Slowly eliminated and may be found in the urine for several months after taking the last dose. Arsenic is said to exist normally in traces in the thymus and thyroid glands, the brain and skin, a fact to be remembered in testing a supposed case of arsenic poisoning.

Toxicology.—Chronic poisoning: May be caused by a single, large dose, but almost always by prolonged absorption. Arsenic has been found in aniline dyes, wall paper, stuffed animals, pigments, shot, and other substances, and may be absorbed from any of these sources. Among the first symptoms are puffiness about the eyes, stiffness of facial muscles, loss of appetite, nausea, laxity of the bowels, symptoms of a winter cold; later cutaneous eruptions, swelling of the liver, sometimes a brown pigmentation, hair and nails may fall out, formication and paralysis in the extremities and in aggravated cases a semi-idiotic or epileptic condition. In treating, remove patient from source of poisoning, give potassium iodide to aid elimination, tonics. *Acute poisoning:* Minimum fatal dose is about $1\frac{1}{2}$ grains. Death usually occurs within twenty-four hours; one case is reported of death in twenty minutes; sometimes the patient lives for weeks or months and finally dies from the results of an overdose. Symptoms usually occur in one-half to one hour, varying with the form taken and the condition of the stomach. Sense of faintness, constriction of the throat, intense thirst, nausea, pain in the abdomen, incessant vomiting and retching, vomit sometimes containing blood (coffee-ground color), purging and later rice-watery stools from the shredded mucous membrane in them, diminished urine, tenesmus, cramps in the extremities; cold, clammy skin; feeble, rapid pulse; weak breathing, pallor, coma; sometimes death in convulsions. Symptoms are very similar to those of Asiatic cholera. In a few cases symptoms of irritation are absent and only have collapse and coma; the symptoms may rarely be those of a narcotic. In treating, wash out the stomach with stomach tube or give emetics, as mustard or apomorphine; then large amounts of freshly prepared ferric

hydroxide, which is the antidote; remove and give more iron; if iron hydroxide is not at hand, use magnesium hydroxide; opium if necessary, demulcent drinks, heat to the body; stimulants, as strychnine, atropine, caffeine, or digitalis if necessary; large amounts of water to flush the kidneys.

Preparations and Doses.—Arsenic trioxide, $\frac{1}{60}$ to $\frac{1}{10}$ gr. (0.001 to 0.006 Gm.); Solution of arsenous acid, Solution of potassium arsenite, Solution of sodium arsenate; Solution of iodide of arsenic and mercury, 1 to 10 ♏ (0.06 to 0.6 Cc.); Sodium arsenate; Arsenous iodide, $\frac{1}{20}$ to $\frac{1}{8}$ gr. (0.003 to 0.008 Gm.).

[ANTIMONII ET POTASSII TARTRAS.

Synonyms.—Tartar emetic, Tartarated antimony. *Formula:* $2K(SbO)C_4H_4O_6 . H_2O$.

Source.—By boiling oxide of antimony with potassium bitartrate and water.

Description.—Colorless, transparent crystals, or white granular powder; crystals become white on exposure; soluble in 15.5 parts of water, insoluble in alcohol; odorless; disagreeable, metallic taste.

Action and Uses.—Formerly used much more than now; other salts of antimony have similar actions. *External:* Has been used as **irritant,** counterirritant, and pustulant, but the sore produced is painful and difficult to heal. *Alimentary canal:* Small doses cause irritation, nausea, vomiting, due to action on mucous membrane and also on vomiting nerve centre. Used as an **emetic** and nauseant in beginning of bronchitis and croup, but other emetics are better; too slow and depressing to be used as an emetic in cases of poisoning. *Nervous system:* Depressed, but largely due to disturbance of alimentary canal and circulation. *Circulation:* Heart is primarily accelerated, due to vomiting, and then depressed, due to direct action on the heart as well as the nerves; blood pressure falls. Formerly used as a **cardiac depressant** in fevers and **antiphlogistic** in inflammations. *Respiration:* First quickened, then slowed and labored; secretion from mucous membrane is increased; **expectorant,** used in bronchitis and croup and

to abort a cold. *Muscles:* Generally depressed by large doses; formerly used to reduce dislocations and strangulated hernia. *Skin:* Sweat is decidedly increased; used as a **diaphoretic** in some fevers. Temperature is reduced on account of general depression and diaphoresis. Secretions are generally increased; urine may be increased or diminished. Tartar emetic is badly borne by children, aged or weak persons. *Toxicology:* Symptoms resemble those of arsenic quite closely; the vomiting may be more violent and continuous and there may be more depression. In treating, irrigate with a solution of tannic acid; an emetic is rarely needed; give mucilaginous drinks, morphine for pain, external heat, stimulants, as strychnine, atropine, digitalis, alcohol.

Preparations and Doses.—Tartar emetic, $\frac{1}{16}$ to $\frac{1}{4}$ gr. (0.004 to 0.015 Gm.) as an expectorant or diaphoretic; $\frac{1}{2}$ to 2 gr. (0.03 to 0.12 Gm.) as emetic. Wine of antimony, 5 to 30 ♏ (0.3 to 2 Cc.). Compound syrup of squills, 1 to 60 ♏ (0.06 to 4 Cc.).

CHROMII TRIOXIDUM.

Synonyms.—Chromium trioxide, Chromic acid, Chromic anhydride. *Formula:* CrO_3.

Source.—From potassium dichromate by the action of concentrated sulphuric acid.

Description.—Small, needle-shaped or prismatic crystals; dark purplish-red color; deliquescent; very soluble in water; decomposes and is decomposed by alcohol, ether, and many other organic substances; odorless; caustic, destroying animal and vegetable tissues. It should be kept in glass-stoppered bottles and should not be allowed to come in contact with cork or other organic matter. Contamination with sulphuric acid makes it more deliquescent and gives it more of a scarlet color.

Action and Uses.—Applied in concentrated solution (1 to 3) it is a strong oxidizer and **caustic,** less penetrating and less painful than potassium hydroxide; used for warts and small growths, in cauterizing poisoned wounds. In solutions of about 1 to 40 it is **antiseptic** and disinfectant; used for foul

ulcers, gonorrhea, leucorrhea, ozena, ulcers in the mouth, syphilitic patches, parasitic skin diseases. In a 1 per cent. solution it is an astringent and hardening agent, coagulating albumin. It is not used internally.

CERII OXALAS.

Synonym.—Cerium oxalate. *Formula:* $Ce_2(C_2O_4)_3 \cdot 10H_2O$.

Source.—From a solution of purified cerium sulphate by adding oxalic acid.

Description.—White powder, permanent, insoluble in water or alcohol, odorless, tasteless. U. S. P. defines it as a mixture of oxalates of cerium, didymium, and lanthanum, and of other rare metals of this group.

Action and Uses.—Action is not known. Used chiefly as an **anti-emetic** for vomiting of pregnancy, seasickness, or where the vomiting is not due to irritation of the stomach; it often fails. Used as a **sedative** in gastralgia, dyspepsia, diarrhea; nerve tonic in chorea.

Dose.—$\frac{1}{2}$ to 5 gr. (0.03 to 0.3 Gm.) and often much larger.

IODUM.

Synonym.—Iodine. *Formula:* I.

Source.—From the ash of sea-weeds and from the mother-liquor left on getting out Chile saltpetre in South America.

Description.—Blue-black, friable, rhombic plates; metallic lustre, volatilized on exposure, stains skin brown; soluble in about 5000 parts of water and 10 of alcohol; characteristic odor; acrid, disagreeable taste.

Action and Uses.—*External:* Causes warmth, redness, swelling, some pain, discoloration, and later exfoliation of the skin. In weak solution it is a mild **irritant**, but if often applied or applied in strong solution it is a vesicant. It is rather slow in action, but continued and penetrating. One of the most frequently used **counterirritants**; used for inflamed joints or glands, abscesses, lung affections, and almost any disease

where a counterirritant is wanted. **Sorbefacient** for enlarged glands, hypertrophied tonsils, and inflammatory products in other parts. **Disinfectant** by breaking up organic molecules; used in sores, lupus, ringworm, other skin diseases, bites of rabid animals. A solution of sodium thiosulphate is the best agent to remove stain or excess of iodine. *Alimentary canal:* Except in minute doses it causes nausea, and vomiting; in minute doses it may increase the appetite, acting as a **tonic**, or combined with phenol it may act as a sedative and allay obstinate vomiting. It is an **alterative**, affecting the thyroid gland particularly and through it the body. Iodothyrin, the active principle of the gland, is increased. It was used in goitre, syphilis, and in other diseases where potassium iodide is now generally given. Iodine in the body is changed chiefly to iodides. *Toxicology:* Produces nausea, vomiting, suppression of the urine, fatty degeneration of the heart and liver and, collapse; death has rarely occurred. Give emetics or wash out the stomach; also starchy demulcents, sodium bicarbonate, stimulants.

Preparations and Doses.—Tincture, 1 to 5 ♏ (0.06 to 0.3 Cc.). Compound solution, 1 to 10 ♏ (0.06 to 0.6 Cc.). Ointment.

PHOSPHORUS.

Synonym.—Phosphorus. *Formula:* P.

Source.—From calcium phosphate by heating with carbon and sand in an electric furnace.

Description.—Translucent, nearly colorless, waxy solid; gives off white fumes which are luminous in the dark and on exposure it takes fire in the air; surface gets white or red on keeping a long time in water; nearly insoluble in water, soluble in 350 parts of absolute alcohol; garlic odor; disagreeable taste. Should be kept under water. The amorphous or red phosphorus is much less energetic than the ordinary phosphorus.

Action and Uses.—Not used externally and its use internally is much less than formerly. Seems to have a **specific** effect on bone, making the cancellous part more dense; used

in osteomalacia, rickets, ununited fractures. Increases the number of red blood corpuscles; used in convalescence from exhausting diseases, and pernicious anemia. **Stimulant** to the nervous system; used in nervous exhaustion, neuralgia, alcoholism. **Aphrodisiac,** used in sexual impotence. **Alterative,** used in skin diseases. Probably exists in the blood as phosphorus or an organic compound and is eliminated largely in organic combination in the urine, though a small amount is probably oxidized to phosphoric acid. The elimination of nitrogenous compounds is increased, carbon dioxide and glycogen diminished.

Toxicology.—Less than 1 grain has been fatal. A child was killed from sucking two matches. Symptoms do not usually come on for several hours. Death may result within a day, but usually not for four to eight days. *Symptoms:* Pain in stomach, nausea, vomiting, the vomit having a garlic odor and being phosphorescent in the dark; sometimes diarrhea. Nausea and vomiting may keep up; but more often the patient apparently recovers. In a few days symptoms reappear: vomiting of bloody matter, jaundice, general weakness, weak pulse, hemorrhages from various parts of the body, collapse, coma; sometimes convulsions and delirium. Postmortem examination shows fatty degeneration of the liver, kidneys, heart, and intestines; also ecchymoses in the tissues. Formerly chronic poisoning was common, but not so many cases since red phosphorus is used in match factories; necrosis of the jaw was the common symptom. *Treatment:* Wash out stomach or give emetics, albuminous drinks; copper sulphate as emetic was formerly advised, but not now; avoid fixed oils; give oxidizing agents, as hydrogen dioxide, old oil of turpentine, inhalation of oxygen, potassium permanganate, charcoal

Preparation and Doses.—$\frac{1}{150}$ to $\frac{1}{50}$ gr. (0.0004 to 0.001 Gm.). Pills.

SULPHUR SUBLIMATUM.

Synonyms.—Sublimed sulphur, Flowers of sulphur. *Formula:* S.

Source.—Occurs in volcanic countries, in sulphur beds, and in combination with iron as well as other metals.

Description.—Yellow powder, permanent, insoluble in water, nearly insoluble in alcohol, slight odor, faintly acid taste. Sulphur lotum, washed sulphur, is odorless and tasteless, the acid having been neutralized and washed out. Sulphur præcipitatum, precipitated sulphur, milk of sulphur, or lac sulphur is more nearly white and much finer than sublimed sulphur; odorless and tasteless. Roll sulphur or brimstone is similar to sublimed sulphur, but is in the form of rolls or masses.

Action and Uses.—Sulphur itself is inert when applied to the surface of the body, but is slowly converted into hydrogen sulphide, and applied to a raw surface some sulphurous and sulphuric acids may be formed; hydrogen sulphide and sulphurous acid kill bacteria and are poisonous to higher forms of life. Sulphur is used as an **antiseptic** and **parasiticide** for scabies, acne, eczema, psoriasis, and other eruptions; also used as a mild vascular stimulant and irritant. Sulphur when burned forms sulphur dioxide, which with water makes sulphurous acid, and this is used for disinfecting rooms after the presence of contagious diseases; one-quarter to one pound of sulphur may be used for every 1000 cubic feet. (See Acidum Sulphurosum.) *Alimentary canal:* Most of the sulphur passes through unchanged, but a little hydrogen sulphide and other sulphides are formed and after absorption are partially oxidized to sulphates or combined with organic matter. Sulphides increase peristalsis and secretions and are antiseptic; the stool is formed, but soft; used as a **laxative** in pregnancy, stricture of the bowel, constipation of children, hemorrhoids, anal fissure; often combined with cream of tartar; precipitated sulphur only should be used internally. **Alterative**, used in chronic rheumatism, sciatica, skin diseases, chlorosis. Slightly **diaphoretic** and stimulant to the skin. Hydrogen sulphide combines with hemoglobin and may produce symptoms of asphyxia; in large amounts it paralyzes the nervous system.

Preparations and Doses.—Precipitated sulphur, ¼ to 2 ʒ (1 to 8 Gm.); Compound glycyrrhiza powder, ½ to 2 ʒ (2 to 8 Gm.); Sublimed sulphur, Washed sulphur, Ointment of sulphur.

SULPHURIS IODIDUM.

Synonym.—Iodide of sulphur. *Formula:* Not definitely known; S_2I_2 has been given.

Source.—Heating a mixture of iodine and sulphur to fusion.

Description.—Grayish-black, brittle masses of a crystalline structure, metallic lustre, nearly insoluble in water; the iodine is soluble in alcohol, gradually loses iodine on exposure; odor of iodine; acrid taste. If this is a compound the combination is very feeble and many believe it to be a mixture of iodine and sulphur.

Action and Uses.—Supposed to have the properties of both elements. Used as an efficient **parasiticide** in acne, eczema, and other skin diseases.

CARBO ANIMALIS.

Synonyms.—Animal charcoal, Boneblack, Ivoryblack. *Formula:* C.

Source.—Roasting bones and meat.

Description.—Black powder or granular fragments; absorbs gases; insoluble in water or alcohol; odorless; tasteless. The purified charcoal is made by digesting charcoal with hydrochloric acid and washing.

CARBO LIGNI.

Synonyms.—Charcoal, Wood charcoal. *Formula:* C.

Source.—Burning some soft wood, as willow, in ovens or away from much oxygen.

Description.—Black powder, free from gritty matter; absorbs gases; odorless; tasteless.

Action and Uses of Charcoal.—External: Animal charcoal can absorb about ten times its volume of oxygen and on account of this condensed oxygen it can act as an oxidizer, **deodorant** and **disinfectant.** Used to absorb noxious gases, as

a poultice on foul ulcers. Also has the power of removing from solution some inorganic salts, many alkaloids, coloring substances, and other compounds; when the power of absorption and oxidation becomes exhausted it can be regenerated by heating. *Internal:* Willow charcoal is generally used to absorb gases, to relieve gastric and intestinal fermentation, flatulent dyspepsia, gastralgia, heartburn, epidemic dysentery and fermentative diarrheas. Used as an **antidote** for alkaloidal poisoning by absorbing the alkaloids; the charcoal should be removed; animal charcoal is better here.

Dose.—10 to 60 gr. or more (0.6 to 4 Gm.).

ORGANIC AND SYNTHETIC COMPOUNDS.

PHENOL.

Synonyms.—Carbolic acid, Phenic acid, Phenic alcohol, Hydroxybenzene. *Formula:* C_6H_5OH.

Source.—Obtained by purifying a distillate from coal tar. Also made synthetically from benzol.

Description.—Colorless, needle-shaped crystals or a white, crystalline mass; deliquescent and turning red on exposure; soluble in 19.6 parts of water, very soluble in alcohol; characteristic, aromatic odor; diluted solution has a sweetish taste, but when concentrated it has a burning, caustic taste. Various reasons have been given for the formation of the red color; some writers say it is due to the oxidation of some impurity, others that it is due to a little iron or the absorption of ammonia; one of the latest explanations is that hydrogen dioxide with ammonia, phenol, and a trace of a metal (probably copper) causes the coloration. Probably oxidation plays some part, as sulphurous acid tends to prevent it.

Action and Uses.—Phenol was one of the first antiseptics used and probably received a reputation much above what it deserves. *External:* Poison to all forms of protoplasm, varying in its activity on different bacteria; has less effect on digestive ferments than on bacteria. In solution it precipitates albumin, causing a burning sensation and a reddening, followed by local anesthesia; penetrates rather deeper than most metallic antiseptics; many cases of poisoning have resulted by absorption from a wound or abraded surface. A 1 per cent. solution will kill most germs, but a 2 to 3 per cent. solution is the strength usually applied to wounds

or to the body. Used as an **antiseptic** in surgery, for washing wounds, for burns, ulcers, eczema, dermatitis, scabies, different forms of ringworm, preventing pitting of smallpox. Not used in surgery so much now on account of greater care on the part of surgeons, and also because of safer antiseptics. A 4 per cent. or 5 per cent. solution relieves itching from almost any cause, as in eczema, psoriasis, lichen, urticaria, vulvitis; also used to **disinfect** instruments, clothing, bed-pans, drains, etc., although the crude acid is better for drains and urinals. A 1 per cent. solution has been used as a gargle or spray for sore throat, tonsillitis, diphtheria, coryza, asthma. A 2 per cent. solution has been injected into poisoned wounds, lupus, syphilitic abscesses, and boils. A strong solution or the pure phenol causes no vesication, but a white eschar which soon comes off, leaving a brownish stain. It is a superficial caustic, less painful and less efficient than others; it may cause gangrene; even a 5 per cent. solution applied to a finger for twenty-four hours caused gangrene, necessitating amputation of the finger; applied on cotton it is a sedative for toothache. A solution in oil is only slightly antiseptic, the oil preventing the phenol from penetrating the germ. *Alimentary canal:* Medicinal doses give a cooling, sedative sensation in the stomach, but are probably so diluted and changed as to have but little antiseptic power. Used as a **sedative** and **antiseptic** in gastro-intestinal irritation, fermentative dyspepsia, flatulence, erysipelas, malarial fevers; highly recommended by some for scarlet fever; said to be nearly as good as the antitoxin in tetanus. *Nervous system, Circulation, Respiration:* Medicinal doses have practically no effect; larger doses first stimulate and then depress. *Kidneys:* Phenol is said to be a normal constituent of the urine. Absorbed from a wound or taken internally it is eliminated in the urine mostly unchanged; part is oxidized, forming pyrocatechin and hydroquinone, both of which are unstable and are changed, forming bodies that give a smoky appearance to the urine and a dark-green to brown or black color; combines with sulphates so that barium chloride does not precipitate them.

Toxicology.—One of the most common suicidal and accidental poisons because one of the easiest obtained. Minimum

fatal dose has not been determined; 6 grains have produced dangerous symptoms and ½ an ounce has frequently caused death. A very large toxic dose may cause death in a few minutes from paralysis of the respiratory centre; more often the patient lives from one to ten hours. The **symptoms** are: Burning pain in alimentary canal, white eschars in the mouth, vomiting, purging, odor of acid in the breath; cold, clammy skin; anxious face, contracted pupils, lowered temperature; pulse rapid and thready, getting weaker and irregular; respiration rapid and shallow, then labored and noisy; urine suppressed, stupor, coma, sometimes convulsions, death from asphyxia. In **treating**, wash out the stomach; give albuminous demulcents, soap; soluble sulphates, as sodium or magnesium, to form the inert sulphocarbolates, but it is somewhat doubtful if these are formed in the body; saccharated lime, external heat, stimulants to prevent shock, atropine, artificial respiration. External corrosion is treated with alcohol, which is said to neutralize the phenol; alcohol has been given internally with good results when phenol has been taken by the mouth, but it should be removed quickly, as it may simply dilute the poison without forming a compound; it must come in contact with the phenol.

Preparations and Doses.—Phenol, ½ to 2 gr. (0.03 to 0.12 Gm.). Glycerite of phenol, 3 to 10 ♏ (0.18 to 0.6 Cc.). Ointment.

CRESOL.

Synonyms.—Cresylic acid, Tricresol, Methylphenol, Kresol. *Formula:* C_7H_7OH.

Source.—Obtained from the "phenol" distillates from coal tar.

Description.—Colorless or straw-colored liquid, turning yellowish brown on long exposure; heavier than water; soluble in 60 parts of water, very soluble in alcohol; phenol-like odor. This is a mixture of three isomeric compounds, ortho-, meta-, and paracresol.

Action and Uses. — Related to phenol chemically and closely resembles it in physiological effect. More powerful **antiseptic, disinfectant,** and deodorant than phenol, and much

less poisonous, although not free from danger; used like phenol, chiefly externally. Metacresol is more antiseptic and less poisonous than the ortho- or paracresol. Compound solution of cresol is an emulsion of cresol made with soap and is miscible with water, giving a turbidity. Cresol is an ingredient in several proprietary remedies, as Creolin, Lysol, Solutol, Solveol, Phenolin; it is also combined with iodine or sodium salicylate to form several antiseptics.

Preparations and Doses.—Cresol, ½ to 2 ♏ (0.05 to 0.12 Cc.). Compound solution of cresol.

CREOSOTUM.

Synonyms.—Creosote, Kreosot.

Source.—From wood tar by distillation and purification.

Description.—Colorless or yellowish, oily liquid; nearly permanent; heavier than water; soluble in about 140 parts of water, and in alcohol; characteristic, smoky odor; burning, caustic taste. It is a mixture of phenols and phenol derivatives, chiefly guaiacol and creosol, the composition varying with the wood and method of obtaining. Beech is the wood generally preferred. Creosote should not be confused with the so-called coal-tar creosote, which is an impure carbolic acid and should not be substituted for creosote.

Action and Uses.—Very similar in action to phenol, at least as strongly antiseptic and much less toxic. *External:* **Antiseptic, parasiticide,** and local sedative; largely supplanted by phenol. *Internal:* Largely replaced by guaiacol. Used as an **antiseptic** and **sedative** in fermentative dyspepsia, flatulence, reflex vomiting, as in case of pregnancy or seasickness, cholera morbus, typhoid fever, or dysentery. Chiefly used in tuberculosis of the lungs; best given by the mouth with cod-liver oil or with a vehicle, but has been given by inhalation and by hypodermic injection. Some physicians think it curative, while others think it only aids by being a stimulating expectorant, and still others doubt its value at all. The commencing dose should be small and gradually increased as tolerance

is established. In case of poisoning the symptoms and treatment are similar to those of phenol.

Preparations and Doses. — Creosote, 1 to 5 ♏ (0.06 to 0.3 Cc.), increased to 20 ♏ (1.3 Cc.) or more. Creosote-water, 1 to 8 ℥ (4 to 30 Cc.).

CREOSOTI CARBONAS.*

Synonyms.—Creosote carbonate, Creosotal.

Source.—From creosote.

Description.—Thick, yellowish, oily liquid; insoluble in water, soluble in alcohol; nearly odorless and tasteless.

Action and Uses.—Action is similar to creosote, but less irritating and poisonous; interferes less with digestion. Used as a substitute for creosote in phthisis, bronchitis, pneumonia, indigestion.

Dose.—5 to 20 ♏ (0.3 to 1.3 Cc.) or more.

GUAIACOL.

Synonym.—Guaiacol. *Formula:* $C_7H_8O_2$.

Source.—From creosote by purifying the distillate which comes over between 200° and 205° C., or made synthetically.

Description.—Colorless, crystalline solid, melting at 28.5° C., or a colorless liquid, heavier than water; soluble in 53 parts of water and in all proportions of alcohol; aromatic odor.

Action and Uses.—Similar to creosote, about as irritating in the alimentary canal, but preferred because of its more definite composition. Chiefly used in tuberculosis; may be beneficial on account of its expectorant effect, but probably has no specific action on the tubercle bacillus; physicians disagree as to its value as compared with creosote. Guaiacol (10 to 50 ♏) painted on the abdomen, thigh, or chest rapidly reduces a febrile temperature, causing some exhaustion, weakness, and profuse perspiration; this may be due to absorption and be one of the symptoms of poisoning; temperature soon rises again. It has been used as an antipyretic

in typhoid, malarial, and acute fevers. It is said to be a powerful local **anesthetic,** rivalling cocaine; used in orchitis, neuralgia, sciatica, rheumatism, toothache, and injected for minor operations.

Doses.—2 ♏ (0.12 Cc.) gradually increased to 15 ♏ (1 Cc.).

GUAIACOLIS CARBONAS.

Synonyms. — Guaiacol carbonate, Duotal. *Formula:* $(C_7H_7O)_2CO_3$.

Source.—Obtained by passing carbonyl chloride into a solution of guaiacol in sodium hydroxide solution.

Description.—White, crystalline powder; insoluble in water, soluble in 48 parts of alcohol; nearly odorless and tasteless.

Action and Uses.—Similar to guaiacol, but less irritating in the alimentary canal, less likely to disturb digestion; broken up in the alkaline intestinal fluids, liberating guaiacol. High claims have been made for it as an abortive and curative agent in typhoid fever, but these have not been sustained. Also used in tuberculosis and bronchitis, having at least an expectorant effect.

Several compounds of guaiacol have been prepared: The benzoate (Benzosol), cinnamate (Styracol), phosphate, and salicylate (Guaiacol-salol) are used as substitutes for guaiacol and as intestinal antiseptics, being less irritating.

Dose.—Guaiacol carbonate, 5 to 20 gr. (0.3 to 1.3 Gm.), gradually raised to ½ or 1 ʒ (2 or 4 Gm.).

PHENYLIS SALICYLAS.

Synonyms.—Phenyl salicylate, Salol. *Formula:* $C_6H_5C_7H_5O_3$.

Source.—From a mixture of sodium salicylate and sodium phenolate by treating with certain dehydrating agents.

Description.—White, crystalline powder; permanent; soluble in about 2330 parts of water and 5 of alcohol; faint, aromatic odor; slight, characteristic taste.

Action and Uses.—External: Has but little effect, as it is active only when decomposed; has been used with talc as a dusting powder for wounds, ulcers, burns, and skin diseases. *Internal:* Practically no action in the stomach, but in the alkaline fluids of the intestine it is decomposed, forming phenol and a salicylate; on account of the phenol it is more dangerous than salicylic acid and cases of poisoning have occurred. Its chief use is that of an **intestinal antiseptic**; used in diarrhea, dysentery, duodenal catarrh, intestinal indigestion, cholera; has been highly recommended for typhoid fever, but some physicians dispute its efficiency. It is a disinfectant to the genito-urinary tract, but apt to irritate the kidneys; used in catarrh of the bladder. Used like salicylic acid for rheumatism. In pharmacy it is used to coat pills to prevent their dissolving in the stomach.

Salophen (Acetylparamidophenol salicylate)* occurs in minute scales, insoluble in water, but soluble in alcohol; odorless and tasteless. It is decomposed in the intestine, forming a salicylate and acetylparamidophenol, which is less toxic than phenol. Action and uses are similar to salol. Cresyl salicylate (Cresalol), naphthyl salicylate (Betol), acetol salicylate (Salacetol), and acetylsalicylic acid (Aspirin) are compounds somewhat similar to salol, and are used as substitutes for salol and salicylic acid.

Dose.—Salol or Salophen, 5 to 15 gr. (0.3 to 1 Gm.).

ICHTHYOLUM.*

Synonyms. — Ichthyol, Ammonium Ichthyolsulphonate. *Formula:* $(NH_4)_2C_{28}H_{36}S_3O_6$.

Source.—Obtained by purifying the distillate from the destructive distillation of a bituminous rock containing fossilized fish.

Description.—Clear, reddish-brown, syrupy liquid; miscible with water in all proportions and with alcohol in equal volumes; bituminous odor and taste. The ammonium compound of the ichthyolsulphonic acid is the most common, although compounds with other bases, as sodium, calcium, and zinc,

have been introduced. Ichthyol may be deodorized by hydrogen dioxide, but it is questionable whether this has the same effect.

Action and Uses.—Mild irritant and **antiseptic**; less powerful than phenol; action may be due to sulphur in organic combination. Used locally chiefly, in burns, scalds, frost-bites, ulcers, chronic eczema, psoriasis, and other skin diseases; a 10 to 50 per cent. ointment may be used. **Sorbefacient** and **antiphlogistic** in rheumatic and inflamed joints and glands. *Internal:* Used as **alterative** in chronic diseases, as rheumatism, gout, syphilis, pulmonary diseases; it is thought by some that ichthyol decreases tissue waste and is beneficial in this way; others dispute this.

Thiol is primarily obtained by heating certain paraffin oils with sulphur and later treating with sulphuric acid and ammonia. It occurs as a dark-brown powder soluble in water, or as a reddish-brown liquid containing about 40 per cent. of thiol. It is proposed as a substitute for ichthyol, being much less disagreeable.

Dose.—Ichthyol, 3 to 15 gr. (0.3 to 1 Gm.).

IODOFORMUM.

Synonyms.—Iodoform, Tri-iodomethane. *Formula:* CHI_3.

Source.—Obtained by warming sodium carbonate, iodine, and alcohol together. Other methods are used.

Description.—Lemon-yellow powder or lustrous crystals; slowly volatile; nearly insoluble in water, soluble in 46.7 parts of alcohol; characteristic, persistent odor; disagreeable, sweetish, and somewhat iodine-like taste. About 96 per cent. of iodoform is iodine.

Action and Uses.—External: No effect on the unbroken skin. At first it was thought to be **antiseptic**. Later it was shown that it had to be disinfected, that it is not antiseptic in itself except it be decomposed. The explanation was offered that when applied to a broken surface the living cells liberate iodine slowly. Some physicians claim that it is one of the best agents for destroying disease germs; others that the only

benefit comes from the drying up of the surface, lessening secretion, and making a less suitable medium for the germs. Iodoform has been very largely used as a dressing for wounds and burns, in surgical operations, in sloughing ulcers, buboes, sores of all kinds, particularly tuberculous and syphilitic; in diseases of the skin, rectum, or vagina. It has some local **anesthetic** effect, but its disagreeable odor, the many nearly odorless substitutes proposed, and the fact that it has caused a good many deaths have combined to lessen its use. It may be used as a dusting powder, gauze, ointment, or collodion; not more than a dram should be dusted on a large surface; the odor may be masked to some extent by cumarin, balsam of Peru, roasted coffee, or volatile oils. *Internal:* Has been used as an **alterative** in syphilis, scrofula, and tuberculosis; rarely given internally now.

Toxicology.—Numerous cases of poisoning have resulted from using too much iodoform on wounds or broken surfaces. Some persons are more susceptible than others. Symptoms are: headache, increased temperature, iodoform taste, restlessness; sometimes an eruption, as in scarlet fever; melancholia, delirium, and mania greater than with most other poisons, coma, collapse, death or permanent insanity. Symptoms may be absent except deep sleep, coma, collapse. Post-mortem examination shows fatty degeneration of liver and kidneys, and ecchymoses. In treating, give sodium bicarbonate in large doses to aid elimination, water to flush the kindeys, diaphoretics, baths, alcoholic stimulants, artificial respiration, and external heat if necessary.

Preparation and Dose.—Iodoform, 1 to 5 gr. (0.06 to 0.3 Gm.). Ointment.

IODOLUM.

Synonyms.—Iodol, Tetraiodopyrrol. *Formula:* C_4I_4NH.

Source.—Obtained by action of iodine on an alcoholic solution of pyrrol.

Description. — Light grayish-brown, crystalline powder; nearly insoluble in water, soluble in about 9 parts of alcohol; odorless and tasteless. Contains about 89 per cent. of iodine.

Action and Uses.—Used as a substitute wherever **iodoform** is indicated. Decomposed in the tissues, but the iodine is less easily liberated than in case of iodoform; nearly odorless and less toxic, but symptoms of poisoning have occurred. Internally it has been used for chronic gastritis, catarrh, or bronchitis.

Dose.—1 to 5 gr. (0.06 to 0.3 Gm.).

THYMOLIS IODIDUM.

Synonyms.—Thymol iodide, Dithymol diiodide, Aristol. *Formula:* $C_{20}H_{24}O_2I_2$.

Source.—Obtained by adding a solution of iodine in an aqueous solution of potassium iodide to a sodium hydroxide solution of thymol.

Description.—Bright, chocolate-colored, or reddish, bulky powder; slowly decomposed on exposure; insoluble in water, nearly insoluble in alcohol; slight, aromatic odor. Contains about 45 per cent. of iodine.

Action and Uses.—Used as a substitute for **iodoform**; is non-irritating, nearly as efficient, less desiccating; is said not to destroy germs; symptoms of iodine poisoning may occur.

EUROPHEN.*

Synonyms.—Europhen, Diisobutylorthocresol iodide. *Formula:* $C_{22}H_{29}O_2I$.

Source.—Obtained similarly to aristol except using cresol for thymol.

Description.—Amorphous, yellow powder; decomposes when moist; insoluble in water, but readily soluble in alcohol; slight, saffron-like odor; five times as bulky as iodoform; contains about 28 per cent. of iodine.

Action and Uses.—Used as a substitute for iodoform.

RESORCINOL.

Synonyms.—Resorcin, Resorcinum, Metadihydroxybenzene. *Formula:* $C_6H_4(OH)_2$.

Source.—May be made from several compounds, but chiefly from benzene.

Description.—Colorless, needle-shaped crystals, becoming pink on exposure; soluble in 0.5 part of water, very soluble in alcohol; faint, peculiar odor; sweetish, bitter taste.

Action and Uses.—External: Strong **antiseptic,** resembling phenol, but less toxic; has slight local **anesthetic** action. In solution (1 per cent. to 3 per cent.) it is used for skin diseases, particularly chronic, scaly, and parasitic diseases; a common ingredient in hair dyes and dandruff remedies. *Internal:* Formerly used as an **antipyretic** but it depresses the heart, causes profuse perspiration, lowers the temperature of fever without shortening or lessening its severity, produces symptoms tending to collapse; fallen into disuse on account of its dangerous properties.

Dose.—1 to 10 gr. (0.06 to 0.6 Gm.).

HYDROQUINONE.*

Synonyms.—Hydroquinol and Hydrochinone. *Formula:* $C_6H_4(OH)_2$.

Source.—Obtained by oxidation of aniline.

Description.—Long, colorless needles; soluble in about 17 parts of water, very soluble in alcohol; odorless; sweetish taste. Isomeric with resorcin.

Action and Uses.—Resembles resorcin, but is stronger and more toxic. Its antipyretic action is only temporary.

Pyrocatechin* (Catechol) is isomeric with resorcin and is similar to it in action, but more poisonous; not used now.

Dose.—Hydroquinone, 1 to 10 gr. (0.06 to 0.6 Gm.).

NAPHTHALENUM.

Synonyms.—Naphthalene, Naphthalin, Naphtalin, Tar camphor, Camphor balls. *Formula:* $C_{10}H_8$.

Source.—Obtained as a deposit from certain distillates of coal tar.

Description.—Colorless or white, shining plates or laminæ; slowly volatilized and becoming brown on exposure; insoluble in water, soluble in 13 parts of alcohol; characteristic odor; burning, aromatic taste.

Action and Uses.—External: **Antiseptic,** but must come in intimate contact with the matter; used in ulcers, sloughing wounds, pus cavities, syphilitic sores, cancers, psoriasis, and skin diseases. **Disinfectant** for urinals. Preservative for woolen goods and furs from moths. *Internal:* Absorbed from the alimentary canal only slightly; used as an antiseptic for fermentative dyspepsia, diarrhea, dysentery, typhoid fever. **Anthelmintic** for tapeworms and also thread-worms when injected. Stimulating **expectorant** for chronic bronchial troubles; inhaled for pertussis. Renders the urine aseptic and is used in vesical catarrh.

Dose.—5 to 10 gr. (0.3 to 0.6 Gm.).

BETANAPHTHOL.

Synonyms.—Naphthol, Naphtol. *Formula:* $C_{10}H_7OH$.

Source.—Obtained from naphthalene by a somewhat complicated process.

Description.—Colorless or pale buff-colored, shining laminæ, or yellowish-white crystalline powder; permanent in the air; phenol-like odor; sharp, pungent taste.

Action and Uses.—External: **Antiseptic,** several times stronger than phenol. A 10 per cent. ointment is used for scabies, ringworm, psoriasis, prurigo, and other parasitic skin diseases, but may be somewhat irritating. *Internal:* Used as an intestinal antiseptic for flatulent dyspepsia, fetid diarrhea, gastric catarrh, and typhoid fever; less toxic than some other

antiseptics, but in large doses it causes symptoms similar to phenol.

Alphanaphthol* is more antiseptic than betanaphthol, but writers disagree about its toxicity. Hydronaphthol is similar to betanaphthol.

Asaprol* (Abrastol), calcium naphthol sulphonate, is a white, crystalline powder, soluble in water and alcohol. Internally it is used as an **antiseptic** for atonic and fermentative dyspepsia, typhoid fever; not so irritating as betanaphthol; antipyretic and analgesic for epidemic influenza, rheumatism, sciatica.

Alumnol* (Aluminum naphtholsulphonate), is a white powder, soluble in water, less soluble in alcohol, acid and alcoholic solutions having a fluorescence. It is **astringent** and **antiseptic,** precipitating albumin which precipitate dissolves in excess of albumin, making this compound more penetrating than some others; does not cause irritation or pain. Used as a dressing for wounds, ulcers, inflamed condition of the skin or mucous membrane; a 2 per cent. solution is used for gonorrhea.

Dose—Betanaphthol, 2 to 10 gr. (0.12 to 0.6 Cm.).

PYROGALLOL.

Synonym.—Pyrogallic acid. *Formula:* $C_6H_6O_3$.

Source.—From gallic acid by heating with water under pressure.

Description.—Light, white laminæ or fine needles, becoming gray or brown on exposure, soluble in 1.6 parts of water and 1 of alcohol; odorless; bitter taste.

Action and Uses.—It is used as an **antiseptic**, **disinfectant,** and **parasiticide** in skin diseases, as psoriasis, ringworm, lupus, leprosy, and epithelioma. It should not be used internally or applied over too large a surface, as it may cause poisoning.

LIQUOR FORMALDEHYDI.

Synonyms.—Solution of formaldehyde, Formalin, Formol. *Formula:* CH_2O (formaldehyde).

Source.—Obtained by passing vapors of methyl alcohol and air over heated copper coils which partially oxidize the alcohol, then passing the formaldehyde into water.

Description.—A clear, colorless liquid; on standing paraformaldehyde separates; this may be prevented by borax or glycerin; on exposure the aldehyde vaporizes, soluble in water and alcohol in all proportions; pungent, irritating odor; caustic taste. It should contain at least 37 per cent. of formaldehyde.

Action and Uses.—It is a strong **antiseptic** and **disinfectant,** diffusing rapidly. The gas penetrates much better in the presence of moisture, but does not penetrate as deeply as has been claimed. It coagulates albumin and a 1 per cent. solution kills all spores. It is largely used in disinfecting rooms, furniture, and clothing contaminated by infectious diseases and is superior to other similar agents; it is more rapid than sulphur dioxide, does not bleach organic colors or destroy fabrics, is less toxic to persons, and is more easily controlled. The room should be tightly sealed and for every 1000 cubic feet of space $\frac{1}{2}$ to 2 pints of the solution should be vaporized and the room kept closed for eight to ten hours. Applied to the broken skin, even when highly diluted, it is painful, but has been used in infected wounds, tuberculous ulcers, and abscesses. Inhaled it irritates the mucous membrane, causing a prickling sensation, tears, salivation, bronchitis; used for pertussis, influenza, and diphtheria. Used as a preservative for cadavers and specimens, as a fixing agent for microscopic specimens, and in tanning hides. Rarely used internally.

HEXAMETHYLENAMINA.

Synonyms.—Urotropine, Hexamethylene-tetramine, Uritone, Formin, Aminoform. *Formula:* $C_6H_{12}N_4$.

Source.—Obtained from the solution of formaldehyde by the action of ammonia-water on it.

Description.—Colorless, lustrous crystals; permanent; soluble in 1.5 parts of water and 10 of alcohol; odorless; sweetish taste.

Action and Uses.—It is absorbed readily and on excretion by the kidneys it is broken up into formaldehyde and ammonia. It is chiefly used as an **antiseptic** and **disinfectant** for the genito-urinary tract and is one of the best of this class of agents. Used in ammoniacal decomposition of the urine, cystitis, pyelitis, gonorrhea, phosphaturia; given to typhoid-fever patients to disinfect the urine and to prevent cystitis. Formaldehyde gives a soluble compound with uric acid; used in cases of gravel, calculi, gout, and uric acid diathesis. Sometimes given as a prophylactic before operating on the urinary tract. Somewhat of a diuretic, but not always.

Urotropine salicylate* (Saliform) is a white, crystalline powder; soluble in water and alcohol; sweet, astringent taste; used similarly to urotropine.

Dose.—Urotropine, 2 to 15 gr. (0.12 to 1 Gm.).

PARAFORMALDEHYDUM.*

Synonyms.—Paraform, Triformol, Trioxymethylene. *Formula:* $(CH_2O)_3$. It is a condensation product of formaldehyde.

Source.—From a solution of formaldehyde on standing or on slowly heating.

Description.—Colorless, crystalline powder, insoluble in water.

Action and Uses.—It can be decomposed by heat, generating formaldehyde. Chiefly used in the disinfection of rooms.

Amyloform* is a white, odorless, non-irritating powder made from a solution of formaldehyde and starch; used as a substitute for iodoform.

Glutoform* (Glutol, Formaldehyde gelatin) is a white, insoluble powder, obtained by the action between formaldehyde and gelatin; used as a substitute for iodoform in surgical dressings.

Tannoform* is a pale, reddish, light powder; insoluble in water; odorless and tasteless; made by the action of formaldehyde on tannic acid. It has been used as a dusting pow-

der for burns and excessive sweating; as an astringent in pruritus, bed-sores, chancres; internally as an astringent and antiseptic in intestinal catarrh, diarrhea, and enteritis.

Dose.—4 to 8 gr. (0.25 to 0.5 Gm.).

Thymoform* is a yellowish powder, insoluble in water, soluble in alcohol; nearly tasteless; slight thymol-like odor; a compound of formaldehyde and thymol; used as an antiseptic dressing.

ACETOZONE.*

Synonym.—Benzoyl acetyl dioxide. *Formula:* $C_9H_8O_4$.

Source.—Hydrogen dioxide with other compounds.

Description.—White, crystalline powder; sparingly soluble in water or alcohol; solution slowly decomposes; odorless; sharp, biting taste. Commercial article is generally mixed with an inert absorbent.

Action and Uses.—External: Antiseptic for tonsillitis and throat troubles, abscesses, gangrene, urethritis, vaginitis. *Internal:* Chiefly used as an antiseptic in typhoid fever, said to lessen tendency to tympanites, diarrhea, temperature, and nervous symptoms; used in diarrhea, Asiatic cholera, and bowel troubles.

Dose.—A solution of 1 part in 2000 of water may be used in place of drinking water.

BENZOSULPHINIDUM.

Synonyms.—Saccharin, Gluside, Anhydride of orthosulphamide benzoic acid. *Formula:* $C_7H_5NSO_3$.

Source.—Usually derived from toluene.

Description.—White, crystalline powder; permanent; soluble in 250 parts of water and 25 of alcohol; odorless; intensely sweet taste, which is perceptible in dilution of 1 to 100,000. Soluble saccharin and soluble gluside are names given the sodium salt, which is generally preferred on account of its greater solubility.

Dulcin (Sucrol, Valzine, Paraphenetol carbamide) is a synthetic compound derived from paraphenetidin. It occurs in colorless needles or scales, soluble in 800 parts of water and 25 of alcohol; odorless; intensely sweet taste.

Action and Uses.—Saccharin is used as a sweetening agent and as a substitute for sugar by diabetic patients. It is an antiseptic and inhibits digestion, consequently should be used with caution.

Dose.—½ to 5 gr. (0.03 to 0.3 Gm.).

TERPINI HYDRAS.

Synonym.—Terpin hydrate. *Formula:* $C_{10}H_{20}O_2 . H_2O$.

Description.—Colorless, lustrous, rhombic prisms; nearly odorless; slightly aromatic, bitter taste; permanent. Obtained by action of nitric acid on oil of turpentine and alcohol.

Action and Uses.—Very similar to terebene; chiefly as an expectorant.

Dose.—1 to 10 gr. (0.06 to 0.6 Gm.).

ACETANILIDUM.

Synonyms.—Acetanilide, Antifebrin, Phenylacetamid. *Formula:* C_8H_9NO.

Source.—Obtained by boiling aniline and glacial acetic acid, distilling, and crystallizing.

Description.—Colorless, shining, micaceous laminæ or crystalline powder; permanent; soluble in 179 parts of water and 2.5 of alcohol; odorless; slight, burning taste.

Action and Uses.—Most antipyretics derived from coal tar are also strongly analgesic, somewhat hemostatic and slightly antiseptic; they are apt to cause some skin eruption, sweating, and cyanosis. Their effects on different persons vary, and also vary on the same person at different times. *External:* Acetanilide is slightly **antiseptic**, acting as a desiccant probably. Used as a dusting powder in place of iodoform for venereal ulcers and wounds; as an ointment for eczema, erysipelas, and

urticaria. **Hemostatic** and slightly sedative, but sometimes irritating. Toxic effects may result from absorption. Small amounts added to solutions of alkaloids prevent decomposition. *Internal:* Broken up and partially oxidized in the body, eliminated to some extent as paramidophenol. *Nervous system:* The sensory nerves and the reflex activity of the cord are depressed; it is a powerful **analgesic.** Used for neuralgia, sciatica, migraine, headache, lumbago, locomotor ataxia, rheumatism, dysmenorrhea, reflex coughs, epilepsy; of but little use in pain due to disease of internal organs. Slightly narcotic. *Circulation:* Small doses have little or no effect on the heart; large ones first accelerate and then depress it, and are more apt to cause cyanosis and collapse than most other antipyretics. On account of its depressing effects, caffeine is often given with it. Arterioles are slightly contracted, blood pressure rises and then falls with the slowing of the heart. Large doses cause the formation of methemoglobin and still larger ones disintegrate the red corpuscles and arrest the white corpuscles. *Respiration:* Not affected by medicinal doses, but lowered by toxic doses. *Kidneys:* Slightly diuretic; urea, and uric acid are increased in amount by small doses and greatly so by large ones; eliminated in urine as partially oxidized compounds; large doses may make the urine smoky in color. *Skin:* Mildly diaphoretic, but may cause profuse sweating, due to dilatation of the cutaneous vessels. It sometimes produces a rash resembling that of measles. *Temperature:* Normal temperature is not affected by medicinal doses; a febrile temperature is reduced, due to lessened heat production and to some extent to increased heat dissipation. Its effect is noticed within an hour and the minimum temperature reached in about two hours; the temperature is held down for several hours, but not so long as by some other antipyretics and rises as the drug is eliminated; less prompt and reliable than antipyrine. Powerful **antipyretic**; used in eruptive fevers and fevers in which there is a high temperature; strong, full pulse; dry skin, thirst; in acute rheumatism, bronchitis, influenza, pneumonia; contra-indicated in exhaustive fevers, anemia, or tuberculosis. At present the tendency of physicians is to restrict the use of antipyretics

in cases where the temperature is not dangerous and in cases of very high temperature to resort to the cold bath, which increases heat dissipation, stimulates circulation and the brain, and perhaps heat production a little. Whether antipyretics or only the cold bath for high temperatures should be used is a disputed question. Acetanilide has an **antiperiodic** action in malaria.

Toxicology.—This being a drug often used by the laity, quite a number of cases of poisoning have occurred. Death has resulted from taking 5 grains; recovery has followed after taking 1 dram. Often there is nausea and vomiting, fulness of the head, ringing in the ears, profuse sweating; cold, clammy skin; slow and irregular respiration and circulation, lowered temperature, sometimes paralysis of motor nerves and muscles, sometimes convulsions, collapse, frequently marked cyanosis, death. In treating, empty the stomach, give diffusible stimulants, as whisky, ammonia, or ether, strychnine or caffeine, for the respiration, atropine for the circulation, oxygen inhalations for the cyanosis, external heat.

Acetbromanilide* (Antisepsin, Asepsin, C_8H_8NOBr), made by the action of bromine on acetanilide, is similar to acetanilide in action and uses.

Preparations and Doses.—Acetanilide, 1 to 10 gr. (0.06 to 0.6 Gm.). Compound acetanilide powder, 5 to 15 gr. (0.3 to 1 Gm.). Acetbromanilide, 3 to 10 gr. (0.18 to 0.6 Gm.).

METHYLACETANILIDUM.*

Synonym.—Exalgine. *Formula:* $C_9H_{11}NO$.

Source.—From aniline by the action of acetyl chloride.

Description.—Needles or prisms, permanent, soluble in 60 parts of water and freely in alcohol; odorless; tasteless.

Action and Uses.—Similar to acetanilide. Chiefly used as an **analgesic,** said to be superior to antipyrine; used in cases of rheumatism, neuralgia, sciatica, chorea. In large doses it is poisonous, acting like acetanilide.

Dose.—1 to 5 gr. (0.06 to 0.3 Gm.).

ANTIPYRINA.

Synonyms.—Antipyrine, Phenazone, Analgesine, Methozine, Anodynine, Parodyne, Phenyldimethylpyrazolon. *Formula:* $C_{11}H_{12}N_2O$.

Source.—Obtained in various ways from phenylhydrazine.

Description.—Colorless, crystalline powder or tubular crystals; permanent; soluble in less than 1 part of water and in 1 part of alcohol; odorless; slightly bitter taste.

Action and Uses.—In action it is similar to acetanilide except as noted: It is more prompt and reliable, but the effect passes off sooner; considered to be more of a cardiac depressant and more dangerous, but is less likely to cause collapse and cyanosis; more of a cerebral sedative; more acceleration of the respiration; more of a diaphoretic; more likely to cause eruption. It is less likely to decompose red corpuscles; has less effect on metabolism; causes less elimination of nitrogenous matter; less diuretic. It is an active antipyretic and analgesic, also somewhat of an antiseptic, diuretic, local anesthetic, diaphoretic, hemostatic, and hypnotic. It is used in about the same cases as acetanilide.

Iodopyrine* ($C_{11}H_{11}IN_2O$.), made by mixing solutions of iodine and antipyrine; occurs in colorless, silky, prismatic crystals; slightly soluble in water; nearly odorless and tasteless. It combines the action of iodine and antipyrine and is recommended for asthma and tertiary syphilis.

Antipyrine salicylate* (Salipyrine Salazolon, Salipyrazolin, $C_{11}H_{12}N_2O.\ HC_7H_5O_3$.), made by heating antipyrine and salicylic acid; colorless, crystalline powder; soluble in 200 parts of water and in alcohol; odorless; sweetish-bitter taste. It combines the properties of salicylic acid and antipyrine; used for rheumatism and influenza.

Pyramidon* (Dimethylamido-antipyrine), made from isonitroso-antipyrine; occurs as a yellowish-white, crystalline powder; soluble in water; nearly odorless and tasteless. Said to have about the same effect as antipyrine but a stronger and more lasting effect.

Doses.—Antipyrine, Iodopyrine, Salipyrine or Pyramidon, 1 to 20 gr. (0.06 to 1.3 Gm.).

ACETPHENETIDINUM.

Synonym.—Phenacetin. *Formula:* $C_{10}H_{13}NO_2$.

Source.—Paraphenetidin is formed from phenol and this is heated with glacial acetic acid.

Description.—White, glistening scales or crystalline powder; permanent; soluble in 925 parts of water and 12 of alcohol; odorless; tasteless.

Action and Uses.—Slower and less powerful than acetanilide or antipyrine, but is much safer and the effects last longer; otherwise its action is about the same as acetanilide and it is used in about the same diseases; used more as an **analgesic** than antipyretic. It is also sedative, diaphoretic, antineuralgic, antirheumatic.

Paraphenetidin lactate* (Lactophenin) is a white or colorless, crystalline powder; soluble in about 500 parts of water and 8.5 of alcohol; odorless; slightly bitter taste. In action and uses it resembles phenacetin, but is said to have more sedative effect.

Paraphenetidin citrate* (Citrophen) is a white, crystalline powder; soluble in about 40 parts of water; uses the same as phenacetin.

Monophenetidin citrate* (Apolysin) is a white, crystalline powder; soluble in 25 parts of water and readily in alcohol; peculiar odor; acid taste.

Dose.—Phenacetin, Lactophenin, Citrophen, or Apolysin, 5 to 15 gr. (0.3 to 1 Gm.).

PHENOCOLLI HYDROCHLORIDUM.*

Synonyms. — Amido-acet-para-phenetidin hydrochloride, Phenamin, Glycocoll-para-phenetidin hydrochloride. *Formula:* $C_{10}H_{14}N_2O_2$. HCl.

Source.—From paraphenetidin by the action of chloracetylchloride and then neutralizing with hydrochloric acid.

Description.—White, crystalline powder; soluble in 16 parts of water and readily in alcohol; odorless.

Action and Uses.—Similar to phenacetin. Said to cause less depression than most coal-tar antipyretics. Temperature is lowered by lessened heat production, heat elimination being but slightly affected. Acts within an hour; does not cause destruction of blood corpuscles, collapse, or cyanosis; diaphoresis is less than with antipyrine.

Phenocoll salicylate* (Salocoll) is similar to the hydrochloride in action and uses.

Doses.—Phenocoll hydrochloride or salicylate, 5 to 20 gr. (0.3 to 1.3 Gm.).

CHLORALUM HYDRATUM.

Synonyms.—Hydrated chloral, Chloral hydrate, Chloral, Hydrous chloral, Trichloraldehyde hydrate. *Formula:* $C_2HCl_3O.\ H_2O$.

Source.—By passing dry chlorine gas into absolute alcohol purifying the resulting liquid, mixing with water and crystallizing.

Description.—Colorless, rhomboidal, transparent crystals, slowly volatilized on exposure; an aqueous solution slowly becomes acid, forming hydrochloric acid; soluble in water and alcohol; penetrating, acrid odor; bitter, caustic taste. It liquefies when rubbed with menthol, camphor, phenol, and similar compounds.

Anhydrous chloral is an oily liquid.

Action and Uses.—External: It is somewhat **antiseptic**, used as a wash for wounds, ulcers, cancers, gonorrhea. Parasiticide for skin diseases. Irritant and vesicant when applied in strong solution to the broken skin or mucous membrane. Local **anesthetic**, often with camphor, menthol, or phenol; used for neuralgia, lumbago, toothache, earache, chapped nipples, boils; used to allay itching of eczema, prurigo, and eruptive diseases. *Alimentary canal:* Sometimes used in nervous dyspepsia and in dysentery. *Nervous system:* Chloral hydrate depresses the central nervous system, ultimately paralyzing it; acts first on the brain and in larger doses on the cord and medulla; rarely produces excitement; pupils are

generally contracted. Small doses produce sleep which resembles natural sleep and from which the patient awakens refreshed and generally without ill after-effects unless a little nausea. The patient can be easily aroused, but usually sleeps five to eight hours. Larger doses cause a deeper sleep lasting for ten to fifteen hours. It is a pure, prompt, and certain **hypnotic,** but not entirely safe on account of the depression of circulation and respiration. Used in insomnia from worry, mental overwork, early stages of fevers, or where the sleeplessness is of a neurotic origin; it is of little or no service when due to pain. Used as a cerebral depressant in mania, cerebral inflammation, puerperal convulsions, and delirium tremens; in the latter case the depression is antagonized by the alcohol; sometimes used to straighten up a drunken person. Used as **antispasmodic** in hysteria, infantile convulsions, epilepsy, chorea, whooping-cough, asthma, hiccough, colic, incontinence of the urine, tetanus, and strychnine poisoning, **Sedative** for seasickness, morning sickness of pregnancy, or vomiting from reflex origin; may be given by the rectum; little or no general anesthesia except indirectly in very large doses. It is often given with potassium bromide. Children bear it better than adults. It is contra-indicated in cardiac troubles, depressing diseases, or irritation of the alimentary canal. The temperature is slightly lowered by medicinal doses, due to lessened heat production and to some extent to increased heat dissipation; has an **antipyretic** effect in fevers. *Circulation:* Medicinal doses usually have but little effect. Large doses slow and weaken the heart, by action on the nerve centre in the medulla and on the cardiac muscle, dilate vessels and lower blood pressure and may cause eruption of the skin. It increases the fluidity of the blood and crenates the red corpuscles. It is not decomposed in the blood, forming chloroform, as was once thought. *Respiration:* Medicinal doses render respiration slightly weaker and more shallow. Large doses depress it by acting on the medullary centre. *Metabolism:* It lessens oxidation, although there is said to be an increased destruction of proteids. It is eliminated chiefly in the urine and largely as urochloralic acid; some passes through the skin, causing an eruption.

Toxicology.—Ten grains have caused death; recovery from 1 ounce has taken place. The symptoms resemble those of morphine to some extent; muscles are relaxed, pupils contracted, reflexes are absent, breathing is shallow and slow, pulse feeble and irregular; death generally by respiratory failure. In treating, empty the stomach with the stomach tube; emetics may fail; give strong coffee and diffusible stimulants, strychnine by injection, external heat, artificial respiration. *Chronic poisoning:* The habit is easily formed, but broken with difficulty. The symptoms are deranged digestion, anemia, muscular weakness; weak, irregular heart; dyspnea, deranged liver, jaundice, congestion of the face, hallucinations, loss of memory, sometimes insanity. The withdrawal of the drug must be gradual or serious results may follow.

Chloralose,* a compound of chloral and glucose, occurs in thin crystals; soluble in 170 parts of water; bitter taste. It is a prompt **hypnotic**, has but little effect on circulation and respiration except in large doses; increases reflexes of the spinal cord. It should be given with caution, as it may cause deep unconsciousness and lead to habit. Ten grains have caused death.

Hypnal* (Monochloral antipyrine), made by the action of chloral hydrate on antipyrine and crystallizing from water, is soluble in 30 parts of water. It is said to cause no gastric trouble. It is **hypnotic** and **analgesic**, used for neuralgic insomnia and for coughing of bronchitis and tuberculosis.

Bromal hydrate,* made like chloral hydrate except bromine is used in place of chlorine, is a white, crystalline powder, soluble in water. In action it resembles chloral hydrate, but is more depressing to circulation and respiration, more dangerous. It may cause ill effects, as stupor and salivation.

Doses.—Chloral, 5 to 20 gr. (0.3 to 1.3 Gm.) sometimes as high as 45 gr. (3 Gm.). Chloralose, Bromal hydrate, 2 to 5 gr. (0.12 to 0.3 Gm.). Hypnal, 5 to 20 gr. (0.3 to 1.3 Gm.).

BUTYL-CHLORAL HYDRAS.*

Synonyms.—Butyl-chloral hydrate, Croton-chloral hydrate (improperly so called). *Formula:* $C_4H_5Cl_3O.\ H_2O$.

Source.—Obtained by passing dry chlorine gas into aldehyde and later treating with water.

Description.—Thin, white, glistening scales, soluble in 30 parts of water; sweetish odor; burning, bitter taste.

Action and Uses.—Similar to chloral hydrate, but feebler, less depressing, less poisonous, more analgesic, more disagreeable taste. Used for facial neuralgia, various headaches, sciatica, and dysmenorrhea. Used less now than formerly.

Dose.—5 to 20 gr. (0.3 to 1.3 Gm.).

CHLORALFORMAMIDUM.

Synonyms.—Chloralformamide, Chloralamide. *Formula:* $C_3H_4Cl_3NO_2$.

Source.—Obtained by the reaction between anhydrous chloral and formamide.

Description.—Colorless, lustrous crystals; soluble in 18.7 parts of water and 1.3 of alcohol; odorless; bitter taste.

Action and Uses.—Similar to chloral hydrate, but not so depressing; less liable to cause gastric irritation, slower and less certain, less danger of forming habit, seems not to be cumulative. It is used in cases where chloral hydrate might be used. Highly recommended for seasickness.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

CHLORETONE.*

Synonym.—Trichlor - tertiary - butyl - alcohol. *Formula:* $C_4H_7OCl_3$.

Source.—Obtained by the action of alkalies on chloroform and acetone.

Description.—White crystals, permanent in the air; nearly insoluble in water, soluble in alcohol; camphor-like odor and taste.

Action and Uses.—Similar to chloral hydrate; fairly safe and generally reliable; without marked action on respiration and circulation; more of a local anesthetic and less irritating

than chloral. Used as a **hypnotic** where there is no pain, as antispasmodic, local anesthetic, and antiseptic.

Dose.—5 to 20 gr. (0.3 to 1.3 Gm.).

SULPHONMETHANUM.

Synonym.—Sulphonal. *Formula:* $C_7H_{16}S_2O_4$.

Source.—Obtained by a rather complicated process from anhydrous ethyl hydrosulphide.

Description.—Colorless, prismatic crystals; permanent; soluble in 360 parts of water and 47 of alcohol; odorless; nearly tasteless.

Action and Uses.—**Hypnotic**, less efficient and less dangerous than chloral, but more active than paraldehyde. It does not depress but may stimulate the heart. The action is slow and the patient may not sleep much through the night, but sleep the next day; on this account it should be given in a hot liquid two to four hours before the effect is wanted. It is likely to accumulate and the urine may become reddish brown; in such a case the drug should be stopped and it is well to alternate with some other hypnotic. The habit is not easily formed, but ill effects follow the continued use of the drug; some of these are nausea, vomiting, headache, noise in the ears, ptosis, indigestion, impaired action of the kidneys, persistent eruption; mental, moral, and physical weakness. Several cases of poisoning have occurred. It has little or no effect in relieving pain. Metabolism is somewhat lessened. It is largely eliminated in the urine as ethylsulphonic acid. Used only to produce sleep and opinions are divided as to its value. It seems to be less effective in cardiac troubles.

Dose.—10 to 30 gr. (0.6 to 2 Gm.).

SULPHONETHYLMETHANUM.

Synonym.—Trional. *Formula:* $C_8H_{18}S_2O_4$.

Source.—Obtained by saturating a mixture of ethylmercaptan and methylethylketone with hydrochloric acid gas and then oxidizing with potassium permanganate.

Description.—Colorless, lustrous, crystalline scales; soluble in 195 parts of water, readily soluble in alcohol; odorless; bitter taste.

Action and Uses.—Similar to sulphonal and generally preferred to it because it acts much quicker, usually within a half-hour; not cumulative if the bowels are kept well open; no injurious or unpleasant after-effect; not liable to form habit. A few cases of poisoning have resulted from its use. It is a **hypnotic** and sedative and may be given with phenacetin or acetanilid when pain is present; best given in a hot liquid.

Tetronal* is similar to sulphonal, but is rarely used; often causes vomiting.

Veronal* (Diethyl-malonyl-urea) is a white, crystalline powder soluble in 145 parts of water. It has no effect on circulation and respiration; does not cause nausea; lowers temperature slightly; sometimes causes a rash; not liable to accumulate. Sleep ensues in about an hour and lasts for four to ten hours; often some drowsiness and torpor on awakening. It is a **hypnotic** for insomnia of neurotic origin; can be used in cases of fever, debilitation or cardiac disease. Well given mixed with trional.

Dose.—Trional, Tetronal, or Veronal, 10 to 30 gr. (0.6 to 2 Gm.).

ÆTHYLIS CARBAMAS.

Synonyms.—Urethane, Ethyl urethane. *Formula:* $C_3H_7NO_2$.

Source.—Obtained by the action of alcohol on urea nitrate under heat and pressure.

Description.—Colorless, columnar crystals or scales; very soluble in water and alcohol; odorless; cooling, saline taste.

Action and Uses.—Somewhat resembles paraldehyde in action. Medicinal doses have no effect on circulation and perhaps a stimulating one on respiration. Large doses cause depression and relax muscles. It is a mild **hypnotic**, having the advantages of other hypnotics without their disadvantages except that it is often unreliable; safe and fairly efficient for children.

Phenylurethane* (Euphorin), made by reaction between aniline and ethyl chloroformate, is a white, crystalline powder; sparingly soluble in water, soluble in alcohol; faint, aromatic odor; clove-like after-taste. It is used as an analgesic, antipyretic, antirheumatic, and antiseptic.

Dose.—Urethane, 10 to 30 gr. (0.6 to 2 Gm.). Euphorin, 2 to 8 gr. (0.12 to 0.5 Gm.).

PARALDEHYDUM.

Synonym.—Paraldehyde. *Formula:* $C_6H_{12}O_3$.

Source.—Obtained generally by passing hydrochloric acid gas into ethyl aldehyde.

Description.—Colorless, transparent liquid; volatile; soluble in 8 parts of water and very soluble in alcohol; strong, characteristic odor; burning, disagreeable taste.

Action and Uses.—Resembles chloral hydrate, but is safer and not quite so certain, not so lasting. Depresses the higher centres first and then the reflexes; the heart is slightly stimulated, consequently it can be used in the presence of cardiac disease. In fifteen to twenty minutes it produces a dreamless, refreshing sleep, the patient awakening in five to seven hours without headache or other ill effects. Used as a **hypnotic** in about the same cases as chloral hydrate, can be continued over a long time; no service in case of pain. Occasionally the habit is formed, and the symptoms resemble those of chronic alcoholism; rarely fatal. The disadvantages are its disagreeable taste, the large dose, and the long time before the breath is free from odor. Eliminated by the urine, breath, and skin, sometimes causing an eruption. It is also antiseptic, expectorant, antispasmodic, and diuretic.

Dose.—½ to 2 ℥ (2 to 8 Cc.).

AMYLENUM HYDRATUM.*

Synonyms.—Amylene hydrate, Tertiary amyl alcohol. *Formula:* $C_5H_{12}O$.

Source.—Obtained from amylene by treating with sulphuric acid and later with lime and distilling.

Description.—Thin, colorless liquid; volatile, hygroscopic, soluble in 8 parts of water, readily soluble in alcohol; penetrating odor; burning taste.

Action and Uses.—Resembles paraldehyde, but is more depressing, more hypnotic, more pleasant to take, more rapid and fleeting; less depressing than chloral hydrate and less certain. Stimulates and then depresses circulation, respiration and nervous system. It may be used in the same cases as paraldehyde.

Dose.—15 to 60 ♏ (1 to 4 Cc.).

METHYLTHIONINÆ HYDROCHLORIDUM.

Synonyms.—Methylene blue, Tetramethylthionine hydrochloride. *Formula:* $C_{16}H_{18}N_3SCl$.

Source.—From para-amido dimethylaniline by a somewhat complicated process.

Description.—Dark-green, crystalline powder, or prismatic crystals having a bronze lustre; soluble in water and alcohol, giving blue solutions. Great care should be used in handling it to avoid scattering it, as a small amount produces a large stain.

Action and Uses.—It is an external and internal **antiseptic, antipyretic,** and **antiperiodic** in intermittent fever and malaria, but not as effective as quinine; better effect on children than adults; has no taste and does not cause headache; best staining agent for the malarial plasmodium. **Diuretic,** used in cystitis, diabetes mellitus, gonorrheal urethritis; renders the urine blue. Anodyne in neuralgic and rheumatic affections. Sedative in some forms of excitement of insanity.

Dose.—1 to 8 gr. (0.06 to 0.5 Gm.).

PIPERAZINA.*

Synonyms.—Piperazine, Piperazidine, Diethylene-diamine, Dispermine. *Formula:* $C_4H_{10}N_2$.

Source.—Obtained by the action of ammonia on ethylene bromide or chloride.

Description.—Colorless, crystalline masses or tablets; very hygroscopic; absorbs carbon dioxide from the air; soluble in alcohol; faint, characteristic odor; strong base, forming salts with acids. Aqueous solutions do not keep well.

Action and Uses.—It forms comparatively soluble (in fifty parts of water) compounds with uric acid; the urea is increased and the uric acid diminished in the urine; said to dissolve twelve times more uric acid than lithium carbonate. It is **diuretic** and is used in a uric acid diathesis; opinions differ as to its value. It does not cause depression and is well borne.

Dose.—10 to 15 gr. (0.6 to 1 Gm.).

GLYCERINUM.

Synonyms.—Glycerin, Glycerol. *Formula:* $C_3H_5(OH)_3$.

Source.—From olein and stearin of vegetable and animal fats by decomposing with alkalies or superheated steam.

Description.—Clear, colorless, viscid liquid; sp. gr. 1.25, hygroscopic, miscible with water and alcohol in all proportions; odorless; sweet, warm taste.

Action and Uses.—External: Applied to the broken or unbroken skin it is an irritant by extracting water from the tissues. Diluted it is an **emollient,** used for chapped hands, sore nipples, wounds, boils, coryza, skin diseases. In form of cataplasm of kaolin it is a dehydrating agent and is used to relieve the inflammation of skin, muscles, and joints. Solvent and vehicle for iodine, tannic acid, and other disagreeable medicines. **Antiseptic** and preservative for solid extracts, digestive ferments. *Internal:* Absorbed quickly from the intestine and oxidized in the tissues; to some extent a food, saving the oxidation of fat; used in tuberculosis, but inferior to cod-liver oil. **Demulcent** and sedative in small doses; used for dryness of throat and to allay coughing, in vomiting of pregnancy. **Laxative** in large doses or when given by the rectum; continued use is apt to cause irritation of the rectum;

used in constipation when the fecal matter is in the large intestine. Glycerin is a parasiticide for trichina. It causes a compound in the urine which gives reactions like sugar.

Preparations and Doses.—As a laxative 1 to 4 ℥ (4 to 15 Cc.) by mouth; rather smaller doses by rectum. Glycerites, Suppositories, Cataplasm of kaolin.

TEREBENUM.

Synonym.—Terebene. *Formula*: $C_{10}H_{16}$.

Source.—From oil of turpentine by the action of sulphuric acid, then distilling.

Description.—Colorless, thin liquid, with a rather agreeable, thyme-like odor, aromatic, turpentine taste; lighter than water; becomes resinified and acid on exposure.

Action and Uses.—Resembles oil of turpentine. Used chiefly as a stimulating and disinfecting **expectorant** in bronchitis, emphysema, winter cold, to thin and expel tenacious secretion; diuretic and **disinfectant** of genito-urinary tract in cystitis and urethritis; antiseptic in fermentative dyspepsia.

Dose.—5 to 15 ♏ (0.3 to 1 Cc.).

ALCOHOL.

Synonyms.—Alcohol, Ethyl or Grain Alcohol. *Formula:* C_6H_5OH.

Source.—Obtained by fermentation of sugars, chiefly from starch which has been converted into dextrin.

Description.—Transparent, colorless liquid; volatile; sp. gr. 0.816; slight, agreeable odor; burning taste. Following is a list of official preparations with their percentages by weight of absolute alcohol: Alcohol, 92.3 per cent. Absolute alcohol (Alcohol Absolutum), not less than 99 per cent. Diluted alcohol (Alcohol Dilutum), about 41.5 per cent. Whisky (Spiritus Frumenti), 37 to 47.5 per cent. Brandy (Spiritus Vini Gallici), 39 to 47 per cent. Red wine (Vinum Rubrum),

7 to 12 per cent. White wine (Vinum Album), 7 to 12 per cent.

The following are not official: Rectified alcohol, about 86 per cent. Cologne spirit, about 93 per cent. Proof spirit, about 43 per cent. Rum, Gin, about 40 to 50 per cent. Port wine (Vinum Portense) and Sherry wine (Vinum Xericum), about 15 to 20 per cent. Champagne, about 8 to 13 per cent. Ale, about 5 to 9 per cent. Beer, about 2 to 6 per cent.

Action and Uses.—Moderate amounts stimulate all vital functions and then depress them. Recent laboratory work indicates that it is not a stimulant at all, but a depressant, the apparent stimulation being accounted for in other ways. Clinical testimony seems to show it to be a stimulant and the majority of physicians still hold to the older view. *External:* Applied to the skin it evaporates, producing a feeling of coolness; contracts the bloodvessels, lessening perspiration. Ordinarily about a 20 per cent. solution is used as a local **refrigerant** for sprains, bruises, headache, inflammations, and fevers. When rubbed in it withdraws moisture from the skin, hardening it; used to prevent bed-sores and sore nipples. If its evaporation is prevented, it precipitates albumin temporarily and dilates cutaneous vessels, causing rubefaction, warmth, and later slight anesthesia; used as an **irritant** and stimulant to aid absorption of inflammatory products, as in bruises and rheumatism, in partial paralysis, to prevent the loss of hair; used as an **anesthetic** in myalgia, rheumatism, neuralgia, toothache, herpes zoster. It is used as an **astringent** in the form of a gargle or spray for pharyngitis, tonsillitis, diphtheria, salivation. It is **antiseptic** and disinfectant, a 50 to 70 per cent. solution being more effective than a lower or higher percentage, strong alcohol seeming not to penetrate the germ; used in wounds, abscesses, and ulcers; parasiticide. *Alimentary canal:* Strong preparations temporarily precipitate albumin in the mouth, stimulate secretion of saliva and cause slight anesthesia. In the stomach small or moderate doses have a slight irritating effect, increasing appetite, secretion of gastric juice, peristalsis, digestion and absorption; sometimes the opposite effect results. It is partly

oxidized and to some extent is a food. Used as a stomachic and **tonic** in convalescence, exhaustion from overwork or disease, in critical periods of acute fevers, in the aged and feeble, in anemia and chlorosis, in general debility; the weaker preparations, such as wines and beers, should be given before or with the meal. It is used as a **sedative** and anesthetic (in the form of brandy and chipped ice) to relieve the vomiting of seasickness, pregnancy, yellow fever, and delirium tremens; also used in gastric pain and colic. It is an **astringent** to those not accustomed to it; used in different forms of diarrhea; brandy is more astringent than whisky. Frequently drunkards are troubled with diarrhea. It is a carminative for flatulence and colic of infants. Large doses continued for some time overstimulate the mucous membrane, causing inflammation, lessened secretion of gastric juice and increased secretion of mucus, atrophied gastric glands, permanent dyspepsia, and often gout. The vessels in the liver are congested and the cells overstimulated. *Nervous system:* Alcohol is generally considered a strong stimulant and then depressant; its effects upon the different functions, commencing with the higher, follow the Law of Dissolution. The functions last acquired in life are the first affected, then those acquired earlier and so on down. The stimulation is quickly followed by incoördination and depression, affecting judgment, reason, thought, imagination, emotion, the more delicate muscular movements, speech, walking, sphincters of the anus and bladder, respiration and circulation. Large quantities lessen reflex activity of the cord, which accounts for the fact that a drunken man can receive injuries that would otherwise kill from shock. The vasomotor nerves are partially paralyzed, causing dilatation of the arterioles. It is sometimes given in small amounts as a **hypnotic**, but should rarely be used for fear of forming a habit. It is well given at the end of a hard day's work or the completion of a difficult task, but should not be given at the beginning; experience has proved that less work can be done under the influence of alcohol than without it. *Circulation:* A single moderate dose reflexly stimulates the heart, quickening it and increasing its force and after absorption a similar result follows; later the heart is depressed. Very large doses depress without

stimulating. The bloodvessels are all dilated, especially those in the periphery, giving a feeling of warmth. Blood pressure is raised at first, the increased heart's action more than balancing the dilatation of the vessels. The oxyhemoglobin in the red corpuscles does not part with its oxygen so readily, consequently there is diminished oxidation. Alcohol is a **cardiac** and **general stimulant**. Used during crises of acute fevers, in pneumonia, smallpox, cholera, diphtheria, eruptive and relapsing fevers; low enteric fevers, as typhoid; septic infection, as pyemia, septicemia, erysipelas; used in impending cardiac failure, as in fainting, shock, collapse, hemorrhage, snake-bite, poisoning from narcotics and other poisons. Best given in single dose of whisky or brandy; brandy is more palatable, but whisky is generally purer. It is an **antidote** for carbolic acid poisoning; its action has not been satisfactorily explained. *Respiration:* Quickened and the amount of air inhaled is increased. *Temperature:* Moderate amounts primarily raise and then lower the temperature from increased heat radiation. Cold ordinarily contracts the cutaneous vessels, preventing excessive cooling of the blood; alcohol temporarily renders this function less sensitive, consequently alcohol should not be given before or during exposure to cold, notwithstanding it gives a sensation of warmth. *Skin:* Sweat is increased because of dilatation of the vessels and perhaps stimulation of the glands; hot whisky or brandy is a **diaphoretic**, used in the beginning of colds. *Kidneys:* Urine is increased, due to the increased circulation and stimulation of the glands. Eliminated chiefly in the urine and breath, only traces in the sweat and milk. *Metabolism:* Tissue change is lessened. In moderate doses, about 90 per cent. of the alcohol taken is oxidized, an adult being capable of oxidizing about one and one-half ounces in twenty-four hours. Persons using the weaker preparations frequently become fleshy; and beer contains large amounts of nutritive substances. Sometimes a person addicted to alcohol becomes emaciated because of indigestion. Children and the aged bear it relatively better than adults.

Toxicology.—Acute Poisoning: Very large doses may cause almost immediate death by paralysis of the heart. More fre-

quently the symptoms come on in a few minutes. There is giddiness, unsteady gait, incoherent talking, stupor, stertorous breathing; rapid, weak pulse; dilated pupils, involuntary evacuations of bowels and bladder, coma, death from paralysis of respiration. Occasionally the patient may apparently recover and later die in convulsions. In treating, evacuate the stomach with the tube or with apomorphine hydrochloride, keep the patient warm, give ice for continued vomiting, cold water to the head for congestion, fresh air, ammonia by inhalation, mucilaginous drinks, strychnine, atropine or digitalis, artificial respiration. It is often difficult and sometimes impossible to diagnosticate the coma from that of opium, apoplexy, uremia, epilepsy, or concussion of the brain. *Chronic poisoning:* There is vomiting of a watery fluid and mucus, loose bowels, satiny feeling to the skin, capillaries in the face dilated, indigestion; red, bleary eyes. The liver enlarges, undergoes fatty degeneration and contracts; the kidneys change similarly; the heart hypertrophies. There is a lessened immunity and an increased predisposition to many diseases, particularly tuberculosis, pneumonia, Bright's disease, gout, paralysis, epilepsy and insanity; poor subject for surgical operations. In treating it is probably best to reduce the amount of alcohol gradually, though some advise its complete withdrawal at once. An easily digested diet is given, and often tincture of capsicum to relieve the craving. Sometimes alcohol containing a nauseating drug, as ipecac, is given until he gets a disgust for it. Delirium tremens does not usually come on until several days after the patient has rejected food on account of deranged assimilation; in treating give potassium bromide and chloral hydrate for insomnia; give a nutritive diet; alcohol should not be given unless in small amounts.

Doses.—Whisky or brandy, 2 ℥ to 2 ℨ (8 to 60 Cc.), diluted with an equal volume of water. Wine, 1 to 4 ℨ (30 to 120 Cc.).

CHLOROFORMUM.

Synonyms. — Chloroform, Trichloromethane. *Formula:* $CHCl_3$.

Source.—From alcohol or acetone by the action of chlorinated lime.

Description.—Clear, colorless liquid; volatile, sp. gr. 1.47, not inflammable, soluble in about 200 times its volume of water, miscible in all proportions with alcohol; characteristic, ethereal odor; burning, sweetish taste. It must contain not less than 99 per cent. of chloroform.

Action and Uses.—In many ways it resembles alcohol in its action, but is stronger. *External:* Sometimes used as a **hemostatic** for superficial hemorrhage; rubefacient and **anodyne** for neuralgia, myalgia, sciatica, rheumatism, toothache, itching. Considerable **antiseptic** power, affecting germs and lower forms of life much more than the unorganized ferments; used to preserve urine, toxicological specimens, and drugs. *Alimentary canal:* Causes a burning in the mouth, increased flow of saliva, and anesthesia. The water is used as a vehicle for the administration of disagreeable medicines, particularly the saline salts. In the stomach, small doses act like volatile oils, producing warmth, increasing secretions and peristalsis; it is quickly absorbed. Used as a **tonic** in some forms of dyspepsia; **anti-emetic** in vomiting not due to local inflammation; **astringent** with other astringents for diarrhea, cholera, and cholera morbus; carminative, **vermicide.** *Nervous system:* The symptoms by inhalation illustrate the Law of Dissolution and may be divided into three stages or groups, but there is no marked dividing line between them. *First stage:* That of stimulation, holding of the breath, feeling of warmth, stimulation of the imagination; smarting of the nose, throat, and eyes; increased flow of saliva and tears; vomiting may occur at any stage, but usually on recovering; confusion of the mind; flashes of light in the eyes and ringing in the ears; loss of self-control, exhibiting, different traits, as laughing, crying, swearing; often violent struggling, but not always; dilated pupils and flushed face; circulation and respiration are first increased and then slowed; consciousness is affected and sensation is blunted. *Second stage:* That of anesthesia or depression, pale face; sphincters sometimes relaxed; depression and paralysis of the motor centres in the cord; depression of the sensory centres in the medulla; pupils are contracted; respiration is slow, more

shallow, but regular; heart somewhat slow and weakened, but regular; muscles are relaxed and a raised limb falls heavily; complete loss of sensation and consciousness; reflexes are depressed so that touching the eye causes no response. This is the stage of operation and under proper precautions can be maintained for some time. If the anesthetic is withdrawn the patient passes through the stage of excitement and may then go to sleep or have nausea, vomiting, and giddiness. *Third stage:* That of paralysis, complete depression of reflex excitability; cold, clammy skin; just before death the pupils are generally widely dilated, but not always; feces and urine may be passed involuntarily; respiration is irregular, labored, noisy; pulse is slow, irregular, very weak. When chloroform is pushed at first or given too concentrated, death usually results from paralysis of the heart. If it is more slowly given, death usually results from paralysis of respiration. *Circulation:* First stimulates the heart's action and then renders it slower and weaker and finally paralyzes it. Blood pressure is first raised and then lowered. *Respiration:* Slightly quickened at first, then slowed. It is used as an **expectorant** and to relieve the irritating cough of phthisis, coryza, pleurisy, bronchitis, and influenza. *Precautions:* In about every 3000 cases of administration of chloroform 1 case is fatal. The person giving the anesthetic should be skilled and should give his whole attention to it. False teeth should be removed. Neck and waist bands should be loose to allow free breathing. The patient should have fasted for some hours previous. The lower jaw should be held up to prevent the falling back of the tongue, the head slightly raised. The administration should be gradual; many of the cases of accidents result during the first inhalations. About $3\frac{1}{2}$ per cent. of chloroform vapor should be mixed with about $96\frac{1}{2}$ per cent. of air. The operation should not be commenced until the reflexes are depressed, as several deaths have occurred from shock of the knife before the patient was under the influence of the chloroform. It is contra-indicated in cardiac diseases, lung troubles, diabetes, chronic alcoholism, old age. A third person should be present if the patient is a woman, as she may have sensual emotions. Circulation and

respiration, particularly, should be carefully watched. Antidotes should be at hand. *Treatment:* The head should be lowered if the heart is at fault. Give ammonia, amyl nitrite, or oxygen by inhalation; atropine, strychnine, or ether by hypodermic injection; hot coffee by rectal injection; cold douche to the head, warmth and friction to the body; artificial respiration for one or two hours if necessary.

Chloroform is a general **anesthetic** and **antispasmodic**; used in surgical operations, muscular spasms, dislocations, hernia; biliary, renal, and other colics; spasm of the bladder or rectum, puerperal convulsions, tetanus, hydrophobia, strychnine poisoning, hiccough, asthma, dysmenorrhea, hysteria, chorea, in diagnosis for malingering. It is particularly well borne in labor, a few whiffs will ease the pain and relax the muscles without affecting the uterine contractions. Eliminated chiefly by the lungs and slightly by urine, sweat, and milk. It is possible to anesthetize a sleeping person without waking him, but great care must be used by one skilled in giving chloroform.

Preparations and Doses.—3 to 10 ♏ (0.18 to 0.6 Cc.) by the mouth. 1 ℥ (4 Cc.) is usually sufficient to produce anesthesia by inhalation. Water or Emulsion, 1 to 4 ℥ (4 to 15 Cc.). Spirit, 10 to 60 ♏ (0.6 to 4 Cc.).

BROMOFORMUM.

Synonyms. — Bromoform, Tribrommethane. *Formula:* $CHBr_3$.

Source.—From acetone by the action of chlorinated lime and potassium bromide.

Description.—Colorless liquid, sp. gr. 2.8, slightly volatile, sparingly soluble in water, miscible with alcohol, ethereal odor, sweet taste.

Action and Uses.—It is hardly volatile enough for inhalation and as an anesthetic it has produced alarming symptoms. It has been highly recommended as an **antispasmodic** for whooping-cough, but does not cut short the disease and has caused death. It is used for hiccough, spasmodic asthma,

croup, cough of chronic bronchitis. It produces sleep and insensibility to pain and has been used for insomnia.

Dose.—1 to 5 ♏ (0.06 to 0.3 Cc.).

ÆTHER.

Synonyms.—Ether, Sulpuric ether, Ethyl oxide. *Formula:* $(C_2H_5)_2O$.

Source.—From alcohol by mixing with sulphuric acid and distilling.

Description.—Colorless, transparent liquid; very volatile, inflammable, soluble in 10 times its volume of water, miscible with alcohol in all proportions, boils at about 35° C., characteristic odor; burning, sweetish taste. It contains about 96 per cent. by weight of absolute ether.

Action and Uses.—In many ways ether resembles chloroform, but some differences should be noted. Ether is less irritating to the mucous membranes generally, except that of the respiratory tract; causes more secretion of saliva and bronchial mucus and may cause bronchopneumonia; it is less of a gastro-intestinal irritant when swallowed. It is much less dangerous because it is less depressing to the cardiac, respiratory, and vasomotor centres. It stimulates the heart, making it full and strong, raising the blood pressure, and it is only after comparatively prolonged administration that it depresses the heart and respiration. The peripheral vessels are dilated more and longer. The period of excitement is longer and the struggling greater; more difficult to give and must be given more concentrated—70 per cent. of ether to 30 per cent. of air. It is much more disagreeable to take and the odor remains longer; more likely to produce nausea and vomiting, which is somewhat relieved by 15 grains of a bromide; more irritating to the kidneys and often causes albuminuria; more diaphoretic. Applied locally, it evaporates quicker, produces more cold, and is more dangerous to use by artificial light. It produces less profound narcosis and death takes place more slowly. There is one death in about 10,000 administrations.

Ether is used as a general **anesthetic** in about the same cases as chloroform. It is generally considered much safer than chloroform, is rather better in cardiac diseases, but not so good in respiratory and renal troubles and may be strongly contra-indicated. It is used as a local anesthetic for minor surgical operations by spraying on the part, but the tissue should not be frozen; it makes the tissue hard and the subsequent pain is often as great as that of the operation. Ether is a quick **cardiac stimulant** and may be given in nearly all cases of cardiac depression as in syncope, shock, collapse. Its uses as a **local anodyne, tonic, carminative,** and **antispasmodic** are similar to those of chloroform. It produces death by paralysis of the respiration and the treatment is similar to that of chloroform poisoning.

Doses.—10 to 20 ♏ (0.6 to 1.3 Cc.) by hypodermic injection; 5 to 60 ♏ (0.3 to 4 Cc.) in ice-water or syrup by the mouth; 2 ℥ (60 Cc.) by inhalation will usually produce anesthesia. Spirit or Compound spirit, ¼ to 2 ℥ (1 to 8 Cc.).

ÆTHER ACETICUS.

Synonyms. — Acetic ether, Ethyl acetate. *Formula:* $C_2H_5C_2H_3O_2$.

Source.—From alcohol by distilling with sulphuric acid and anhydrous sodium acetate.

Description.—Transparent, colorless liquid; volatile, inflammable; soluble in about 7 parts of water; miscible with alcohol; acetous odor; burning, acetous taste.

Action and Uses.—In many ways it resembles ether, but is volatilized and absorbed more slowly; has a more pleasant taste and is used alone or with other agents as a **carminative,** stimulant, and **antispasmodic.** By inhalation it is used for nervous coughs and bronchial irritation; externally as an irritant for rheumatism.

Dose.—10 to 30 ♏ (0.6 to 2 Cc.).

ÆTHYLIS CHLORIDUM.

Synonyms.—Ethyl chloride, Hydrochloric ether, Monochlorethane. *Formula:* C_2H_5Cl.

Source.—From alcohol by passing hydrochloric acid gas through it and distilling.

Description.—Transparent, colorless liquid; very volatile, very inflammable; slightly soluble in water, but very soluble in alcohol; characteristic, pleasant odor; burning taste. It should be kept in sealed tubes.

Action and Uses.—It is a general **anesthetic**, more pleasant than ether, but can be given for a short time only and must be given in concentrated vapor; it produces anesthesia in two to five minutes and recovery results in a few minutes. It is used for introducing anesthesia to be followed by ether; used in minor operations, as in dental surgery and reducing dislocations. Sprayed on locally, it produces momentary redness, then a white spot due to freezing; the incision or operation is made at this stage.

ÆTHYLIS BROMIDUM.*

Synonyms.—Ethyl bromide, Hydrobromic ether, Monobromethane. *Formula:* C_2H_5Br.

Source.—From alcohol by treating with sulphuric acid and potassium bromide and distilling.

Description.—Colorless liquid, very volatile, not readily inflammable, easily decomposed by light; sparingly soluble in water, readily soluble in alcohol; ethereal odor; warm, sweet taste.

Action and Uses.—It is a very quick, general anesthetic. 2 to 6 ℥ (8 to 23 Cc.) are put into a mask and applied to the nose for not longer than one minute; anesthesia results in twenty or thirty seconds and lasts for two or three minutes; should not be reapplied. It is comparatively safe if pure, but several deaths have resulted. Its advantages are its agreeable odor; slight irritation, rapid action, and quick return to consciousness; vomiting is apt to occur and may last for hours.

Inhaled for minor operations, as opening boils or abscesses; soporific and local anesthetic. Ethylene bromide, which is more poisonous, should not be confused with ethyl bromide.

Dose.—Internally, 5 to 30 ♏ (0.3 to 2 Cc.).

ÆTHYLIS IODIDUM.*

Synonyms.—Ethyl iodide, Hydriodic ether. *Formula:* C_2H_5I.

Source.—From alcohol by treating with iodine and amorphous phosphorus.

Description.—Colorless liquid, volatile, non-inflammable; nearly insoluble in water, but readily in alcohol; iodine is liberated on exposure to air and light; peculiar, penetrating odor.

Action and Uses.—In large amounts it is an anesthetic, but is not used for this; chiefly as an **antispasmodic** and general stimulant for chronic lung troubles, cardiac dyspnea, and asthma; usually given by inhalation.

Dose.—10 to 15 ♏ (0.6 to 1 Cc.) by inhalation.

TRIMETHYLETHYLENUM.*

Synonym.—Pental. *Formula:* C_5H_{10}.

Source.—From amyl alcohol by treating with zinc chloride and distilling.

Description.—Colorless liquid, very volatile and inflammable, insoluble in water, mustard-like odor.

Action and Uses.—Used as a general **anesthetic** in dental surgery and minor operations. It is as rapid and safe as nitrous oxide, without bad after-effects; slower and more lasting than ethyl bromide, but quicker than chloroform; not absolutely safe.

Ethylene bichloride (Dutch liquid, Ethene chloride $C_2H_4Cl_2$) is probably safer than chloroform, more pleasant and rapid; it is less safe than ether. It is used as a local **anesthetic** for neuralgia.

Ethylidene chloride (Dichlorethane) resembles chloroform, but is probably safer, less depressing to the heart, and complete recovery is more prompt; no bad after-effects.

Doses.—Pental, 5 to 10 ♏ (0.3 to 0.6 Cc.) internally; 2 to 4 ʒ (8 to 15 Cc.) by inhalation.

NITROGENII MONOXIDUM.*

Synonyms.—Nitrous oxide, Laughing gas. *Formula:* N_2O.

Source.—Heating ammonium nitrate slowly to about 200° C.

Description.—Colorless gas; not inflammable, but supports combustion; somewhat soluble in water and alcohol; slight odor; sweetish taste.

Action and Uses.—Very rapid **anesthetic,** the period of anesthesia seldom exceeding a minute. Respiration slow and shallow, heart full and regular beating after respiration has ceased, deadly pale face, dilated pupils, often producing sensations of an erotic nature. It is doubtful if death has ever occurred from it. Used in dentistry and minor surgery.

AMYLIS NITRIS.

Synonym.—Amyl nitrite. *Formula:* $C_5H_{11}NO_2$.

Source.—From amyl alcohol by distilling with sodium nitrite and sulphuric acid.

Description.—Yellow liquid, very volatile, becomes acid on exposure to air and light, almost insoluble in water, miscible with alcohol; ethereal, fruity odor; pungent, aromatic taste.

Action and Uses.—Applied locally it diminishes the activity of the sensory nerves; it has been used as an **anodyne** for headache, toothache, and neuralgia. It is generally given by inhalation. *Nervous system:* It diminishes sensation and reflex action and slowly paralyzes muscles. Used as an **antispasmodic** and **anodyne** in poisoning by strychnine, chloral, and cocaine; in tetanus and hydrophobia; in epilepsy when the patient has an aura a pearl may be broken in the hand-

kerchief and inhaled. Sometimes used in hysterical convulsions, spasmodic dysmenorrhea, puerperal eclampsia, headaches, neuralgia of the fifth nerve, vomiting of pregnancy and seasickness, hepatic and renal colic, and infantile convulsions. *Circulation:* The heart's action becomes very rapid with no alteration of the force, probably due to depression of the inhibitory nerve centre. Vessels are widely dilated, particularly those of the periphery. There is a flushing of the face and later the whole body, a sense of fulness of the head, headache, and throbbing of the arteries. The effects are transitory except the headache, which may last for several hours. It is one of the most prompt and fleeting of the nitrites. Causes the formation of methemoglobin, from which oxygen is liberated less readily; oxidation is diminished. Used in angina pectoris when the blood pressure is high, in dyspnea from heart troubles, in nearly all forms of sudden heart-failure and syncope, but should be given only in small doses. *Respiration:* Quickly absorbed through the lungs, quickening and deepening respiration. Somewhat of an **antipyretic** on account of diminished oxidation and increased heat radiation. It is generally a **diuretic**, but may have the opposite effect. Death rarely follows its administration, but sometimes alarming symptoms do.

Doses.—$\frac{1}{4}$ to 1 ♏ (0.015 to 0.06 Cc.) internally; 2 to 5 ♏ (0.12 to 0.3 Cc.) by inhalation.

SPIRITUS GLYCERYLIS NITRATIS.

Synonyms.—Spirit of nitroglycerin, Solution of nitroglycerin, Spirit of glonoin, Spirit of glyceryl trinitrate. *Formula:* $C_3H_5(NO_3)_3$ (nitroglycerin).

Source.—Nitroglycerin is prepared from glycerin by the action of sodium nitrate and sulphuric acid.

Description.—The official 1 per cent. solution is a clear, colorless liquid; gives a turbidity with about twice its weight of water; produces violent headache when tasted; odor and taste of alcohol. Nitroglycerin is a colorless liquid, violently explosive under percussion; odorless; somewhat aromatic

taste; vapors cause headache. The spirit should be kept in tin cans to avoid danger of breakage and the evaporation of alcohol, leaving the concentrated nitroglycerin. Should any be spilled, pour on a solution of potassium hydroxide at once to decompose it.

Action and Uses.—In the alkaline blood glycerin trinitrate is said to be converted into the nitrite. Similar to amyl nitrite, but more powerful, slower, and more lasting; the headache is more severe and persistent. Persons vary greatly in susceptibility. Used in the same diseases for which amyl nitrite is used, unless very quick action is desired.

Erythrol tetranitrate* (Tetranitrin) is a white solid, explosive on percussion, acting much like nitroglycerin, dilating vessels and lowering the blood pressure; is slow in action, but has a lasting effect. By some it is claimed to be superior to nitroglycerin.

Doses.—Nitroglycerin, $\frac{1}{100}$ to $\frac{1}{50}$ gr. (0.0006 to 0.0012 Gm.). Spirit, $\frac{1}{2}$ to 2 ♏ (0.03 to 0.12 Cc.). Tetranitrin, $\frac{1}{2}$ to 1 gr. (0.03 to 0.06 Gm.).

SPIRITUS ÆTHERIS NITROSI.

Synonyms.—Spirit of nitrous ether, Sweet spirit of nitre. *Formula:* $C_2H_5NO_2$ (ethyl nitrite).

Source.—From alcohol by treating with sodium nitrite and sulphuric acid, distilling, and dissolving the ethyl nitrite in alcohol.

Description.—Clear liquid, faintly yellowish or greenish, volatile, inflammable, becomes acid on exposure to air and light; ethereal, pungent odor; sharp, burning taste. The spirit should contain not less than 4 per cent. of ethyl nitrite.

Action and Uses.—*External:* Evaporates rapidly and causes slight anesthesia. *Internal:* Resembles amyl nitrite, but is much weaker; increases the rapidity of the heart's action, lessens oxidation, lowers blood pressure. It is used as a carminative for flatulence and nausea; as a diffusible stimulant; as **antispasmodic** and nerve sedative in coughing, asthma, and bronchitis; as an expectorant and antipyretic. Chiefly

used as a **diaphoretic** in feverish conditions of children or as a **diuretic** in urinary and kidney troubles; as a diaphoretic it should be preceded by a hot drink and as a diuretic it should be given with ice-water. Not used nearly as much as formerly.

Dose.—$\frac{1}{4}$ to 2 ℥ (2 to 8 Cc.).

ALCOHOL METHYLICUM.*

Synonyms.—Methyl alcohol, Wood alcohol, Wood naphtha,
Formula: CH_3OH.

Source.—From the strongly acid liquid obtained by the destructive distillation of wood.

Description.—Colorless liquid, volatile, inflammable; miscible with water and alcohol in all proportions; peculiar odor; warm taste.

Action and Uses.—Largely used in the arts in place of ethyl alcohol as a solvent. Not often used externally in medicine and never internally. It is of interest on account of the large number of deaths occasioned by drinking it for ethyl alcohol. In single doses it is probably not much more poisonous than ethyl alcohol, but when repeatedly taken it is much more so. More or less oxidized to formaldehyde and formic acid. Some of the symptoms are nausea, vomiting, headache, vertigo, muscular weakness; blindness, which is sometimes total and permanent, due to atrophy of the optic nerve; coma, delirium much more intense and persistent than that from ethyl alcohol.

Methyl ether* is a rapidly acting anesthetic, rarely used.

Methyl iodide* is a general anesthetic, but too irritating to be used as such. It has been used to produce vesication.

Methyl chloride* is used as a local anesthetic by spraying on the part and producing intense cold; used for neuralgia and opening boils or abscesses.

Methylene bichloride* is a general anesthetic, more rapid than chloroform and supposed to be safer, but several deaths have followed its use.

Methylal* (Methylene-dimethyl-ether) is used as a local anesthetic and hypnotic. Dose, 30 to 90 ♏ (2 to 6 Cc.).

Carbon tetrachloride* is less irritating than chloroform, but more dangerous.

ACETONUM.

Synonyms.—Acetone, Dimethyl ketone, Pyroacetic ether. *Formula:* C_3H_6O.

Source.—From the dry distillation of an acetate.

Description.—Thin, colorless liquid; volatile; miscible with water and alcohol; ethereal, mint-like odor; sweetish, pungent taste.

Action and Uses.—It has been used for rheumatism, gout, vomiting, to allay cough, to reduce temperature, but is now chiefly used in pharmacy as a solvent and as the starting point in making chloroform and sulphonal.

CARBONEI DISULPHIDUM.

Synonyms.—Carbon disulphide or bisulphide. *Formula:* CS_2.

Source.—Obtained by heating sulphur and charcoal in a tube.

Description.—Colorless, highly refractive liquid; volatile, inflammable; soluble in 526 parts of water and very soluble in alcohol; strong, peculiar, but not fetid odor; sharp, aromatic taste.

Action and Uses.—Externally it is a rubefacient, antiseptic, and anodyne; used in neuralgia, toothache, and sciatica. Inhaled it causes coughing and anesthesia, headache. Large doses internally act as a narcotic poison. Rarely used in medicine, but largely used in the arts as a solvent.

BENZENUM.*

Synonyms.—Benzene, Benzol, Phenyl hydride. *Formula:* C_6H_6.

Source.—Obtained largely from coal tar.

Description.—Thin, colorless liquid; volatile, inflammable; nearly insoluble in water, soluble in 4 parts of alcohol; strong odor of coal gas.

Action and Uses.—It has been used as a parasiticide in skin diseases, as scabies and pediculi; internally for trichina; antispasmodic for whooping-cough; pulmonary antiseptic; chiefly used as a solvent and in making aniline.

Dose.—5 to 10 ♏ (0.3 to 0.6 Cc.).

BENZINUM.

Synonyms.—Benzin, Petroleum ether. *Formula:* None can be given, as it is a mixture of hydrocarbons

Source.—From petroleum oil by distilling off the lighter hydrocarbons.

Description.—Colorless liquid; very volatile and inflammable; insoluble in water, soluble in about 6 parts of alcohol; strong, characteristic odor.

Action and Uses.—It has been used as a parasiticide for scabies, pediculi, prurigo, and herpes; local anesthetic for neuralgia and rheumatism; anthelmintic for tapeworm; antiseptic for fermentative dyspepsia; chiefly as a solvent

Dose.—5 to 10 ♏ (0.3 to 0.6 Cc.).

PETROLATUM

Synonyms.—Soft petrolatum, Soft paraffin, Cosmolin, Vaselin, Paraffin jelly, Petroleum ointment.

Source.—Obtained as a residue in fractional distillation of petroleum.

Description.—Unctuous mass, yellowish to light amber color, melts between 45° and 48° C., permanent, insoluble in water and nearly insoluble in alcohol, transparent in thin layers, not more than slightly fluorescent, odorless, tasteless. It is a mixture of hydrocarbons.

Petrolatum album, white petrolatum, is similar to petrolatum, but is whiter

Petrolatum liquidum, Liquid petrolatum, Liquid albolene, a mixture of hydrocarbons, is a colorless or slightly yellowish liquid, insoluble in water or alcohol, odorless, tasteless.

Paraffinum, Paraffin, a mixture of solid hydrocarbons obtained by chilling and pressing the residues from distilling petroleum, is a colorless or translucent mass, permanent, insoluble in water or alcohol, greasy to the touch, odorless, tasteless.

Action and Uses.—Petrolatum is not readily changed on exposure, does not chemically affect medicinal agents, is not readily absorbed; used as a bland, neutral **emollient** and **protective** for chapped, chafed, or abraded surfaces; not the base to choose when a medicinal agent is to be absorbed. Liquid petrolatum is used as a soothing application, but largely as a base for medicines to be used as sprays for diseases of the nose and throat. Paraffin when mixed with petrolatum, lard, or other fatty matter is used as a protective and emollient. It has been injected into the subcutaneous tissue to correct deformities, as a saddle-nose.

ALKALOIDS AND NEUTRAL PRINCIPLES.

Atropina, Atropine, $C_{17}H_{23}NO_3$, from Belladonna and other plants of the same family. White, rhombic prisms, varying in shape with the amount of hyoscyamine mixed with it; easily decomposed; soluble in 450 parts of water and 1.46 of alcohol; odorless; bitter taste. It should be tasted with great caution. Usually a small amount of hyoscyamine is left in it.

Atropinæ sulphas, $(C_{17}H_{23}NO_3)_2.H_2SO_4$, occurs in a white, crystalline powder or small needles or prisms; permanent; soluble in 0.38 part of water and 3.7 of alcohol; odorless; bitter, nauseating taste.

Hyoscyaminæ hydrobromidum, Hyoscyamine hydrobromide, $C_{17}H_{23}NO_3.HBr$, from Hyoscyamus and other plants of the Solanaceæ. White, prismatic crystals, or a yellowish, amorphous, resin-like mass; deliquescent; very soluble in water, soluble in 2 parts of alcohol; tobacco-like odor when damp; bitter, nauseous taste; should be tasted only with caution.

Hyoscyaminæ sulphas, $(C_{17}H_{23}NO_3)_2.H_2SO_4$, occurs in white, indistinct crystals or powder; deliquescent; very soluble in water and in 6.4 parts of alcohol.

Hyoscinæ hydrobromidum, Hyoscine hydrobromide, $C_{17}H_{21}NO_4.HBr.3H_2O$, from Hyoscyamus and other plants of the Solanaceæ; is identical with **Scopolaminæ hydrobromidum**, from Scopola. Colorless, transparent, rhombic crystals; slightly efflorescent; soluble in 1.5 parts of water and 16 of alcohol; odorless; acrid, bitter taste.

Morphina, Morphine, $C_{17}H_{19}NO_3.H_2O$, from Opium. Colorless or white, shining prisms, or fine needles, or crystalline powder; permanent; soluble in 3330 parts of water and 168 of alcohol; odorless; bitter taste.

Morphinæ acetas, $C_{17}H_{19}NO_3.HC_2H_3O_2.3H_2O$, occurs in a white or yellowish-white, crystalline, or amorphous powder; loses acetic acid on exposure; soluble in 2.25 parts of water and 21.6 of alcohol.

Morphinæ hydrochloridum, $C_{17}H_{19}NO_3.HCl._3H_2O$, occurs in white, silky, glistening needles or cubes, or crystalline powder; permanent; soluble in 17.2 parts of water and 42 of alcohol.

Morphinæ sulphas, $(C_{17}H_{19}NO_3)_2.H_2SO_4.5H_2O$, occurs in white, feathery, silky needles, or in cubical masses; permanent; soluble in 15.3 parts of water and 465 of alcohol.

Apomorphinæ hydrochloridum, Apomorphine hydrochloride, $C_{17}H_{17}NO_2.HCl$, obtained from morphine by heating in a sealed tube with hydrochloric acid or zinc chloride. Minute, grayish-white prisms, turning green on exposure; soluble in 39.5 parts of water and 38.2 of alcohol; odorless; slightly bitter taste.

Heroinæ hydrochloridum,* Heroine hydrochloride, Diacetylmorphine hydrochloride, $C_{17}H_{17}(C_2H_3O_2)_2NO.HCl$, an artificial alkaloid obtained from morphine. White, crystalline powder; soluble in water and alcohol; odorless; bitter taste. The free base is insoluble in water.

Codeina, Codeine, Methyl morphine, $C_{18}H_{21}NO_3.H_2O$, from opium or from morphine. White or nearly translucent, orthorhombic prisms, octahedral crystals, or crystalline powder; slightly efflorescent; soluble in 120 parts of water and 1.6 of alcohol; odorless; slightly bitter. It occurs in larger crystals and is more soluble than most alkaloids.

Codeinæ phosphas, $(C_{18}H_{21}NO_3)_3.H_3PO_4.2H_2O$, occurs in fine, white, needle-shaped crystals, or crystalline powder; soluble in 2.25 parts of water and 261 of alcohol.

Codeinæ sulphas, $(C_{18}H_{21}NO_3)_2.H_2SO_4.5H_2O$, occurs in long, glistening, white needles or prisms, or crystalline powder; efflorescent; soluble in 30 parts of water and 1035 of alcohol.

Quinina, Quinine, $C_{20}H_{24}N_2O_2.3H_2O$, from various species of Cinchona. White, flaky, or microcrystalline powder; slightly efflorescent; soluble in 1750 parts of water and 0.6 of alcohol; odorless; bitter taste.

Quininæ bisulphas, $C_{20}H_{24}N_2O_2.H_2SO_4.7H_2O$, occurs in colorless, transparent, or whitish crystals, or small needles; efflorescent, turns yellow in the light, soluble in 8.5 parts of water and 18 of alcohol.

Quininæ hydrobromidum, $C_{20}H_{24}N_2O_2.HBr.H_2O$, occurs in light, silky needles; efflorescent, soluble in 40 parts of water and 0.67 of alcohol.

Quininæ hydrochloridum, $C_{20}H_{24}N_2O_2.HCl.2H_2O$, occurs in silky, glistening needles; slightly efflorescent, soluble in 18 parts of water and 0.6 of alcohol.

Quininæ salicylas, $C_{20}H_{24}N_2O_2.C_7H_6O_3.H_2O$, occurs in colorless needles, permanent except becoming pink on keeping, soluble in 77 parts of water and 11 of alcohol.

Quininæ sulphas, $(C_{20}H_{24}N_2O_2)_2.H_2SO_4.7H_2O$, occurs in white, silky, light, flexible crystals, or hard, prismatic needles; easily compressed, efflorescent, soluble in 720 parts of water and 86 of alcohol.

Cinchonidinæ sulphas, Cinchonidine sulphate, $(C_{19}H_{22}N_2O)_2.H_2SO_4.3H_2O$, from different species of Cinchona. White, silky needles or prisms; permanent; soluble in 63 parts of water and 72 of alcohol; odorless; bitter taste.

Cinchoninæ sulphas, Cinchonine sulphate, $(C_{19}H_{22}N_2O)_2.H_2SO_4.2H_2O$, from different species of Cinchona. White, hard, lustrous, prismatic crystals; permanent; soluble in 58 parts of water and 10 of alcohol; odorless; bitter taste.

Strychnina, Strychnine, $C_{21}H_{22}N_2O_2$, from Nux vomica and other plants of the Loganiaceæ. Colorless, transparent, prismatic crystals, or white, crystalline powder; permanent; soluble in 6400 parts of water and 110 of alcohol; odorless; very bitter taste; should be tasted only with caution.

Strychninæ nitras, $C_{21}H_{22}N_2O_2.HNO_3$, occurs in colorless, glistening needles; permanent, soluble in 42 parts of water and 120 of alcohol.

Strychninæ sulphas, $(C_{21}H_{22}N_2O_2)_2.H_2SO_4.5H_2O$, occurs in colorless or white, prismatic crystals or crystalline powder; efflorescent, soluble in 31 parts of water and 65 of alcohol.

Aconitina, Aconitine, $C_{34}H_{47}NO_{11}$, from Aconite. Colorless or white tablets or prisms; permanent; soluble in 3200 parts of water and 22 of alcohol; odorless; tingling sensation when

tasted; should not be tasted unless highly diluted. It is easily decomposed and commercial samples vary greatly in activity.

Caffeina, Caffeine, $C_8H_{10}N_4O_2.H_2O$, from the leaves of Thea sinensis, seed of Coffea arabica, Guarana, Cola nut, or other plants; chiefly from damaged tea. Long, white, flexible, silky needles; generally matted together; permanent; soluble in 45.6 parts of water and 53.2 of alcohol; odorless; bitter taste.

Cocaina, Cocaine, $C_{17}H_{21}O_4$, from Coca. Large, colorless, four- or six-sided, monoclinic prisms; soluble in about 600 parts of water and 5 of alcohol; odorless; bitter, numbing taste.

Cocainæ hydrochloridum, $C_{17}H_{21}O_4.HCl$, occurs in colorless, transparent, monoclinic prisms, lustrous leaflets, or white, crystalline powder; permanent, soluble in 0.4 part of water and 2.6 of alcohol.

Colchicina, Colchicine, $C_{22}H_{25}NO_6$, from the corm or seed of Colchicum. Pale, yellow leaflets or powder, turning darker on exposure to light; soluble in 22 parts of water and very soluble in alcohol; odor suggestive of damp hay; bitter taste.

Hydrastina, Hydrastine, $C_{21}H_{21}NO_6$, from Hydrastis. White or yellowish-white, glistening prisms; frequently larger crystals than most other alkaloids; permanent; almost insoluble in water, soluble in 135 parts of alcohol; odorless; bitter taste.

Hydrastininæ hydrochloridum, Hydrastinine hydrochloride, $C_{11}H_{11}NO_2.HCl$, is an artificial alkaloid made from hydrastine. Pale, yellowish needles or crystalline powder; very soluble in water and alcohol; its aqueous solution has a blue fluorescence; odorless; bitter taste.

Pelletierinæ tannas, Pelletierine tannate, from Granatum. This is described as a mixture of Punicine, Iso-, Methyl-, and Pseudopunicine. Pale yellow, amorphous powder; soluble in 235 parts of water and 12.6 of alcohol; odorless; astringent taste.

Physostigminæ salicylas, Physostigmine salicylate, $C_{15}H_{21}N_3O_2.C_7H_6O_3$, from Physostigma. Colorless or slightly yellowish, shining crystals; slowly becomes red on exposure; soluble in 72.5 parts of water and 12.7 of alcohol; odorless; bitter taste; should be tasted only with caution.

Physostigminæ sulphas, $C_{15}H_{21}N_3O_2.H_2SO_4$, occurs in white or yellowish-white, crystalline powder; very deliquescent, slowly turning reddish, very soluble in water and alcohol. Physostigmine is sometimes called eserine.

Pilocarpinæ hydrochloridum, Pilocarpine hydrochloride, $C_{11}H_{16}N_2O_2.HCl$, from Pilocarpus. Colorless or white, transparent crystals; deliquescent; soluble in 0.3 part of water and 2.3 of alcohol; odorless; slightly bitter taste.

Pilocarpinæ nitras, $C_{11}H_{16}N_2O_2.HNO_3$, occurs in colorless or white, shining crystals; permanent, soluble in 4 parts of water and 60 of alcohol.

Piperina, Piperine, $C_{17}H_{19}NO_3$, from Piper and other plants of the Piperaceæ. Colorless or pale-yellow, glistening crystals; permanent; insoluble in water, soluble in 15 parts of alcohol; odorless; tasteless at first, then sharp, biting taste.

Sparteinæ sulphas, Sparteine sulphate, $C_{15}H_{26}N_2.H_2SO_4.5H_2O$, from Scoparius. Colorless crystals or crystalline powder; hygroscopic; soluble in 1.1 parts of water and 2.4 of alcohol; odorless; slightly saline, bitter taste.

Veratrina, Veratrine, a mixture of alkaloids from Asagræa officinalis. White or grayish-white, amorphous powder; slightly hygroscopic; soluble in 1750 parts of water and 2.2 of alcohol; odorless; causes sneezing when inhaled and a tingling numbness when tasted; it should be tasted with caution.

Berberina,* Berberine, $C_{20}H_{17}NO_4$, from many plants of several families. Bright-yellow prisms or needles; permanent; soluble in 300 parts of water and in alcohol; odorless; bitter taste.

Aloinum, a neutral principle from aloes, varying in chemical and physical properties with the source from which obtained. Microcrystalline powder or minute, needle-shaped crystals; lemon yellow to a dark yellow; slightly hygroscopic; Curaçao aloin soluble in 65 parts of water and 10.7 of alcohol; slight odor of aloes; very bitter taste. The aloins can be distinguished by chemical tests.

Chrysarobinum, Chrysarobin, $C_{30}H_{26}O_7$, a neutral principle from Araroba. Microcrystalline, pale orange-yellow powder; soluble in 4812 parts of water and 308 of alcohol; odorless; tasteless. Not identical with chrysophanic acid

Elaterinum, Elaterin, $C_{20}H_{28}O_5$, a neutral principle from Elaterium. Minute, white scales or prismatic crystals; permanent; insoluble in water, soluble in 262 parts of alcohol; odorless; slightly acrid, bitter taste.

Salicinum, Salicin, $C_{13}H_{18}O_7$, a glucoside from species of Salix and Populus. Silky, shining, crystalline needles or prisms, or a white, crystalline powder; permanent; soluble in 21 parts of water and 71 of alcohol; odorless; very bitter.

Santoninum, Santonin, $C_{15}H_{18}O_3$, the anhydride of santonic acid, obtained from Santonica. Shining, flattened prisms; colorless or white; permanent in air, but turning yellow in light; soluble in 5300 parts of water and 34 of alcohol; odorless; nearly tasteless, but later developing a bitter taste. By recrystallizing from alcohol yellow santonin forms white crystals.

Strophanthinum, Strophanthin, a glucoside or mixture of glucosides from Strophanthus. White or faintly yellowish, crystalline powder; permanent; very soluble in water and alcohol; odorless; very bitter; one of the most poisonous of vegetable principles.

Glycyrrhizinum ammoniatum, Ammoniated glycyrrhizin, Ammonium glycyrrhizate, from Glycyrrhiza. Brownish-red scales; permanent; soluble in water and alcohol; odorless; very sweet taste.

Vanillinum, Vanillin, Methylprotocatechuic aldehyde, $C_8H_8O_3$, naturally in vanilla and is made synthetically from several compounds, chiefly eugenol. White, crystalline needles; permanent; soluble in about 100 parts of water and readily in alcohol; odor and taste of vanilla.

Cumarinum,* Coumarin, Cumaric anhydride, $C_9H_6O_2$, found in tonka beans, sweet clover, and many other plants; made synthetically from salicylic anhydride, acetic anhydride, and sodium acetate. Colorless, prismatic crystals; volatile; soluble in 400 parts of water and readily in alcohol; characteristic, fragrant odor; aromatic, bitter taste.

Camphora. (See page 84.)

Camphora monobromata, Monobromated camphor, Bromocamphor, $C_{10}H_{15}BrO$, made by the action of bromine on camphor and then breaking up the dibromocamphor thus

formed into the monocompound by heat. White, prismatic needles or scales; almost insoluble in water, readily soluble in alcohol; camphoraceous odor and taste.

Menthol, Peppermint camphor, Pipmenthol, $C_{10}H_{19}OH$, a secondary alcohol obtained from oil of peppermint by chilling. Colorless, acicular or prismatic crystals; volatile; slightly soluble in water, but freely in alcohol; peppermint odor; warm, aromatic taste, followed by a cooling sensation.

Thymol, Thymic acid, $C_{10}H_{14}O$, a phenol obtained from oil of thyme or ajowan by fractional distillation, treating with sodium hydroxide and later with hydrochloric acid. Large, translucent prisms; volatile; heavier than water; soluble in 1100 parts of water and readily in alcohol; aromatic, pungent odor and taste.

OILS.

Oleum adipis, Lard oil, is a fixed oil obtained by pressing lard at a low temperature. Colorless or pale-yellow liquid; lighter than water; slight, fatty odor; bland taste. Liable to be adulterated with cotton-seed or petrolatum oil.

Oleum æthereum, Ethereal oil, is a volatile liquid consisting of equal parts of heavy oil of wine and ether. The heavy oil of wine is produced by distilling alcohol and sulphuric acid. Ethereal oil is colorless; has a characteristic odor and bitter, pungent taste.

Oleum amygdalæ amaræ, Oil of bitter almond, is a volatile oil obtained from Prunus amygdalus, var. amara, and other seeds by macerating with water and distilling. Colorless or pale yellow, heavier than water, oxidizing to benzoic acid and becoming solid on exposure; characteristic odor and bitter, burning taste. It should contain between 2 and 4 per cent. of hydrocyanic acid and not less than 85 per cent. of benzaldehyde. Benzaldehyde is official and is made synthetically; often sold as artificial or synthetic oil of bitter almonds.

Oleum amygdalæ expressum, Expressed oil of almonds, Oil of sweet almonds, is a fixed oil obtained by pressing the seed from Prunus amygdalus, var. dulcis or var. amara. Clear, pale yellow, or colorless; lighter than water; nearly odorless; slight, nut-like taste. Quite likely to be adulterated with peanut, cotton-seed, sesame, or other oils.

Oleum anisi, Oil of anise, is distilled from the fruit of Pimpinella anisum or Illicium verum. Thin, colorless, or pale yellow; characteristic odor; sweetish taste.

Oleum aurantii corticis, Oil of orange-peel, volatile oil expressed from the peel of Citrus aurantium. Pale-yellow liquid; lighter than water; characteristic orange odor; aromatic taste. It soon acquires a terebinthinate odor and taste unless protected from air and light; 5 per cent. of alcohol aids its preservation.

Oleum betulæ, Oil of sweet birch, is a volatile oil obtained by macerating and distilling the bark of Betula lenta; very similar to oil of wintergreen.

Oleum cadinum, Oil of cade, obtained by the destructive distillation of the wood of Juniperus oxycedrus (habitat, Europe). Brownish to black liquid, clear, thick; tarry odor; empyreumatic, bitter taste. Used like tar for skin diseases.

Oleum cajuputi, Oil of cajuput, is distilled from the fresh leaves and twigs of Melaleuca leucadendron (habitat, East Indies). Thin, colorless, or greenish liquid; lighter than water; peculiar, camphoraceous odor; aromatic taste. Sometimes green color is due to a little copper. It should contain not less than 55 per cent. by volume of cineol (eucalyptol). Used largely externally in about the same cases as oil of turpentine.

Oleum cari, Oil of caraway, is distilled from the seeds of Carum carvi. Colorless or pale-yellow, thin liquid; lighter than water; odor and taste of caraway.

Oleum caryophylli, Oil of cloves, is distilled from Eugenia aromatica. Colorless or pale-yellow liquid, becoming redder and thicker with age and exposure; heavier than water; odor and taste of cloves. It should contain not less than 80 per cent. by volume of eugenol. Eugenol (U. S. P.) is an unsaturated phenol.

Oleum chenopodii, Oil of American wormseed, is distilled from the seed of Chenopodium anthelminticum. Colorless or pale-yellow, thin liquid; penetrating, camphoraceous odor; pungent taste.

Oleum cinnamomi, Oil of cinnamon, Oil of cassia, is distilled from Cassia cinnamon. Yellowish or brownish liquid, becoming darker and thicker with age and exposure; heavier than water; characteristic odor; sweet, spicy taste. It should contain not less than 75 per cent. by volume of cinnamic aldehyde. Cinnamic aldehyde (Cinnaldehydum) is official.

Oleum copaibæ, Oil of copaiba, is distilled from Copaiba. Colorless or pale-yellow liquid; lighter than water; characteristic odor; pungent, bitter taste.

Oleum coriandri, Oil of coriander, is distilled from Coriandrum sativum. Colorless or pale-yellow liquid; lighter than water; aromatic odor; warm, spicy taste.

Oleum cubebæ, Oil of cubebs, is distilled from Piper cubeba. Colorless or pale-green or yellow liquid; lighter than water; characteristic odor; camphoraceous, aromatic taste.

Oleum erigerontis, Oil of erigeron, is distilled from the flowering herb of Erigeron canadensis. Pale-yellow liquid, becoming darker and thicker with age and exposure; lighter than water; characteristic, persistent odor; aromatic, pungent taste.

Oleum eucalypti, Oil of eucalyptus, distilled from the fresh leaves of Eucalyptus globulus. Colorless or pale-yellow liquid; lighter than water; camphoraceous odor; pungent, cooling taste. It should contain not less than 50 per cent. of cineol (eucalyptol). Eucalyptol (cineol) is official and is an organic oxide.

Oleum fœniculi, Oil of fennel, is distilled from fruit of Fœniculum vulgare. Colorless or pale-yellow liquid; lighter than water; characteristic odor; aromatic taste; similar to oil of anise.

Oleum gaultheriæ, Oil of wintergreen, is distilled from the leaves of Gaultheria procumbens. Colorless liquid, slowly becoming reddish; one of the heaviest oils known; characteristic odor; warm, sweetish taste. Consists chiefly of methyl salicylate. Methyl salicylate is official and is often sold as the oil of wintergreen.

Oleum gossypii seminis, Cotton-seed oil, a fixed oil pressed from the seeds of Gossypium herbaceum. Pale-yellow; sparingly soluble in water or alcohol; lighter than water; odorless; nut-like taste.

Oleum hedeomæ, Oil of pennyroyal, distilled from the leaves and tops of Hedeoma pulegioides. Pale-yellow liquid; lighter than water; mint-like odor and taste.

Oleum juniperi, Oil of juniper, distilled from the fruit of Juniperus communis. Colorless, faintly green or yellowish liquid; lighter than water; characteristic odor; somewhat turpentine-like taste.

Oleum lavandulæ florum, Oil of lavender flowers, distilled from flowering tops of Lavandula officinalis. Colorless or pale-yellow liquid; lighter than water; sweet, fragrant odor; pungent, slightly bitter taste.

Oleum limonis, Oil of lemon, is a volatile oil expressed from the peel of Citrus limonum. Pale-yellow, thin liquid; lighter than water; fragrant odor; aromatic taste. It should contain not less than 4 per cent. of aldehyde calculated as citral. It quickly acquires a terebinthinate odor and taste unless well protected. 5 per cent. of alcohol aids its preservation.

Oleum lini, Oil of linseed, is a fixed drying oil, expressed from the seed of Linum usitatissimum. Yellowish liquid; thickens and darkens on exposure to air; lighter than water; characteristic, but slight odor; bland taste. It is quite likely to be adulterated with rosin, rosin oils, or mineral oils. Only the raw oil should be used in medicine.

Oleum menthæ piperitæ, Oil of peppermint, distilled from leaves and flowering tops of Mentha piperita. Colorless liquid, becoming reddish on exposure; lighter than water; mint-like odor; warm, pungent taste, later producing a cooling sensation. It should contain not less than 50 per cent. of total menthol and not less than 8 per cent. of ester, calculated as menthyl acetate.

Oleum menthæ viridis, Oil of spearmint, distilled from leaves and flowering tops of Mentha viridis. Colorless, yellow or greenish-yellow liquid, becoming red on exposure; mint-like odor and taste.

Oleum morrhuæ, Oil of cod liver, is a fixed oil obtained in different ways from the livers of Gadus morrhua and other species. Pale-yellow, thin liquid, becoming darker and thicker on exposure; lighter than water; slight fishy odor and taste, which are increased by exposure. It is often adulterated with other fish oils.

Oleum myristicæ, Oil of nutmeg, is distilled from the seed of Myristica fragrans. Colorless or pale-yellow, thin liquid; lighter than water; characteristic odor and taste.

Oleum olivæ, Olive oil, is a fixed oil expressed from the fruit of Olea europœa. Pale-yellow or greenish-yellow liquid; lighter than water; slight, peculiar odor; bland, oily taste. It is very often adulterated or substituted by cotton-seed oil and other seed oils.

Oleum picis liquidæ, Oil of tar, is distilled from tar. Nearly colorless at first, becoming dark red brown on exposure; lighter than water; strong, tarry odor and taste.

Oleum pimentæ, Oil of allspice, distilled from the fruit of Pimenta officinalis. Colorless to reddish liquid; heavier than water; aromatic, spicy odor and taste; quite similar to oil of cloves. It should contain not less than 65 per cent. by volume of eugenol.

Oleum ricini, Castor oil, is a fixed oil expressed from the seed of Ricinus communis. Nearly colorless to pale-yellow color; lighter than water; one of the most viscid oils; more soluble in alcohol than most fixed oils; faint odor; disagreeable taste. It is sometimes adulterated with other fixed oils. The cold-pressed oil is the best.

Oleum rosæ, Oil of rose, is distilled from the flowers of Rosa damascena and other species. Pale-yellowish to greenish color; lighter than water; solidifies between 18° and 22° C.; less soluble in alcohol than most volatile oils; strong rose-like odor; sweetish taste. Very often adulterated with oil of geranium and other oils. It should have a saponification value between ten and seventeen.

Oleum rosmarini, Oil of rosemary, is distilled from the flowering tops of Rosmarinus officinalis. Colorless or pale-yellow liquid; lighter than water; characteristic, camphoraceous odor and taste. It should contain not less than 5 per cent. of ester, calculated as bornyl acetate, and not less than 15 per cent. of total borneol.

Oleum sabinæ, Oil of savin, is distilled from the tops of Juniperus sabina. Colorless or yellowish liquid; lighter than water; turpentine-like odor; camphoraceous taste.

Oleum santali, Oil of sandal wood, is distilled from the heartwood of Santalum album. Pale-yellow liquid; somewhat viscid; lighter than water; characteristic odor and taste. It should contain not less than 90 per cent. of alcohols, calculated as santalol.

Oleum sassafras, Oil of sassafras, is distilled from the root bark of Sassafras variifolium. Yellow or reddish liquid, becoming darker on exposure; heavier than water; characteristic odor and taste. It contains about 80 per cent. of safrol. Safrol is an ether and is official.

Oleum sinapis volatile, Volatile oil of mustard, is obtained by macerating the seed of Brassica nigra with water and then

distilling. Colorless or pale-yellow liquid; heavier than water; extremely irritating when inhaled; should not be tasted unless highly diluted. It should contain not less than 92 per cent. of allyl iso-thio-cyanate.

Oleum terebinthinæ, Oil of turpentine, Spirit of turpentine, is distilled from turpentine. Thin, colorless liquid; lighter than water; characteristic odor and taste, which become stronger with age and exposure. Liable to be adulterated with mineral and other oils. The rectified oil is obtained by distilling with a solution of sodium hydroxide; only the rectified oil should be used internally.

Oleum theobromatis, Oil of theobroma, Cacao butter, is a fixed oil expressed from the roasted seed of Theobroma cacao. Yellowish-white solid; becoming whiter with age; lighter than water; melts at 30° to 35° C.; agreeable, faint, chocolate-like odor and taste.

Oleum thymi, Oil of thyme, is distilled from the leaves and flowering tops of Thymus vulgaris. Colorless or pale-yellow liquid; lighter than water; characteristic odor; pungent, then cooling taste. It should contain not less than 20 per cent. by volume of phenols.

Oleum tiglii, Croton oil, is a fixed oil expressed from the seeds of Croton tiglium. Pale-yellow to brownish-yellow liquid; lighter than water; somewhat viscid; slightly fluorescent; slight, peculiar odor; oily, then burning taste. It should be tasted only with caution.

Oleum absinthii,* Oil of wormwood, distilled from the herb of Artemisia absinthium. Dark-green or blue liquid; somewhat viscid; characteristic odor and taste.

Oleum andropogonis citrati,* Oil of lemon grass, is distilled from the Andropogon citratus. Strong, lemon-like odor.

Oleum anethi,* Oil of dill, is distilled from the seed of Anethum graveolens. Colorless, becoming yellow; odor and taste resemble caraway.

Oleum angelicæ,* Oil of angelica, is distilled from Angelica archangelica. Nearly colorless, becoming yellow; odor heavy, somewhat suggestive of musk; spicy taste.

Oleum anthemidis,* Oil of Roman chamomile, is distilled from the flowers of Anthemis nobilis. Light-blue color,

changing to green and yellow on exposure; odor strong; burning taste.

Oleum apii graveolentis,* Oil of celery, is distilled from the seed of Apium graveolens. Colorless to pale yellow, becoming thicker on exposure; celery odor and taste.

Oleum aurantii florum,* Oil of orange-flowers, Oil of neroli, is distilled from the blossoms of the Citrus bigarada. Yellowish, slightly fluorescent, becoming brownish red on exposure. It is often adulterated and several grades of oil are on the market. Oil of petit grain is distilled from the leaves, twigs, and immature fruit of Citrus bigarada and other species.

Oleum balænæ,* Oil of whale, is a fixed oil from several species of whale (Balæna). Strong, disagreeable, fishy odor.

Oleum bergamottæ,* Oil of bergamot, is a volatile oil expressed from the rind of Citrus bergamia. Green to a brown-yellow color; fragrant odor, resembling that of oil of lemon; sometimes adulterated with oil of orange and other oils.

Oleum bubulum,* Neat's-foot oil, is a fixed oil from the hoofs of various animals.

Oleum camphoræ,* Oil of camphor, is distilled from the wood of Cinnamomum camphora in getting camphor. Nearly colorless; strong camphor odor.

Oleum cardamomi,* Oil of cardamom, is distilled from the fruit of Elettaria cardamomum and other varieties. Somewhat viscid, characteristic odor.

Oleum cedri,* Oil of cedar, is distilled from the wood of the Juniperus virginiana, the red cedar. Almost colorless; somewhat viscid; odor of lead pencils.

Oleum ceti,* Sperm oil, is a fixed oil from the whale, Physeter macrocephalus. Yellow to brown liquid; fishy odor; used as a lubricant.

Oleum citronellæ,* Oil of citronella, is distilled from the grass, Andropogon nardus. Yellow to brown liquid, sometimes green from copper; strong, characteristic odor.

Oleum cocois,* Oil of cocoanut, Cocoanut butter, is a fixed oil from Cocos nucifera. White solid, melting at 22° to 28° C.; pleasant odor and taste, soon becoming rancid; used as an emollient and in hair oils.

Oleum cumini,* Oil of cumin, distilled from the fruit of Cuminum cyminum, whose habitat is Africa. Colorless to pale yellow; peculiar odor. Used like other volatile oils.

Oleum geranii,* Oil of rose geranium, distilled from the leaves of Pelargonium odoratissimum and other species. Colorless, greenish, or yellowish liquid; rose-like odor.

Oleum gynocardiæ,* Chaulmoogra oil, is a fixed oil from the seed of Gynocardia odorata and other trees. Yellow to brown solid, of somewhat disagreeable odor; used in leprosy, syphilis, rheumatism. Dose, 2 to 6 gr. (0.12 to 0.36 Gm.).

Oleum iridis,* Oil of orris, is distilled from the roots of Iris florentina and other species. Yellowish-white solid; odor of orris root, but when diluted it has the odor of violets.

Oleum jasmini,* Oil of jasmine, is a volatile oil extracted with petrolatum oil from the flowers of Jasminum grandiflorum. The odoriferous principle, jasmal, can be made synthetically.

Oleum melissæ,* Oil of balm, is distilled from Melissa officinalis. The commercial oil is generally a lemon or citronella oil distilled over balm.

Oleum monardæ,* Oil of horsemint, is distilled from Monarda punctata. Yellow to brown color; thyme-like odor.

Oleum myrciæ,* Oil of bay, is distilled from the leaves of Pimenta acris. Yellow liquid, becoming brown; characteristic odor, but suggestive of cloves.

Oleum nucistæ,* Expressed oil of nutmeg, Nutmeg butter, Oil of mace (misnomer), is a mixture of fixed and volatile oils expressed from Myristica fragrans. It is a solid, usually in blocks; melts at 45° to 51° C.; odor of nutmegs.

Oleum palmæ,* Oil of palm, is expressed from the fruit of Elœis guineensis. Reddish-yellow solid, becoming lighter colored and rancid on exposure; violet-like odor.

Oleum palmarosæ,* Palmarosa oil, East Indian geranium oil, is distilled from the leaves of Andropogon schœnanthus. Rose-like odor; used as an adulterant of oil of rose.

Oleum patchouli,* Oil of patchouly, is distilled from the leaves of Pogostemon patchouli. Yellow to brown liquid; musty, persistent odor; often adulterated.

Oleum petrolati,* liquid petrolatum, Liquid albolene, is a mixture of hydrocarbons from petroleum. Colorless, odorless, tasteless.

Oleum pini,* Oil of pine-needles, is distilled from Pinus sylvestris. This is only one of several pine-needle oils; that from Pinus pumilio is now official in the British Pharmacopœia.

Oleum rhodii,* Oil of rhodium, Oil of rosewood, is distilled from the wood and roots of Convolvulus scoparius. The oil on the market is probably a mixture of rose oil with sandalwood or cedar oil.

Oleum rutæ,* Oil of rue, is distilled from Ruta graveolens. Yellow liquid of intense rue odor.

Oleum sesami,* Oil of sesame, Oil of benne, Teel oil, is a fixed oil expressed from the seeds of Sesamum indicum. Yellowish color, nearly odorless, bland taste, does not readily become rancid; used like olive oil.

Oleum succini,* Oil of amber, is a volatile oil obtained by destructive distillation of amber. Thick, brown liquid; the rectified is thinner and lighter; disagreeable, empyreumatic odor.

Oleum tanaceti,* Oil of tansy, is distilled from Tanacetum vulgare. Yellowish liquid, turning brown.

Oleum valerianæ,* Oil of valerian, is distilled from the roots of Valeriana officinalis. Yellowish green to brownish yellow; penetrating, characteristic odor.

Oleum verbenæ,* Oil of verbena, is distilled from Verbena tryphylla. The commercial oil is generally lemon-grass oil.

Oleum vetiver,* Oil of vetiver, is distilled from roots of Andropogon muriaticus. Dark-yellow to brown liquid; the most viscid of volatile oils; strong, persistent odor.

Oleum vini,* Heavy oil of wine, is obtained by distilling alcohol and sulphuric acid. It consists of ethyl sulphate, ethyl sulphite, and hydrocarbons.

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